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CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY:

HIGH-SPEED SYSTEMS INTEGRATION

THE IMPACT OF CIO TURNOVER ON I.S. GROUPS

AN INTERNATIONAL DATA GROUP PUBLICATION

Security Pacific's William Chenevich

For a world in which the only thing permanent is change.

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A way to control change. Instead of being controlled by it.

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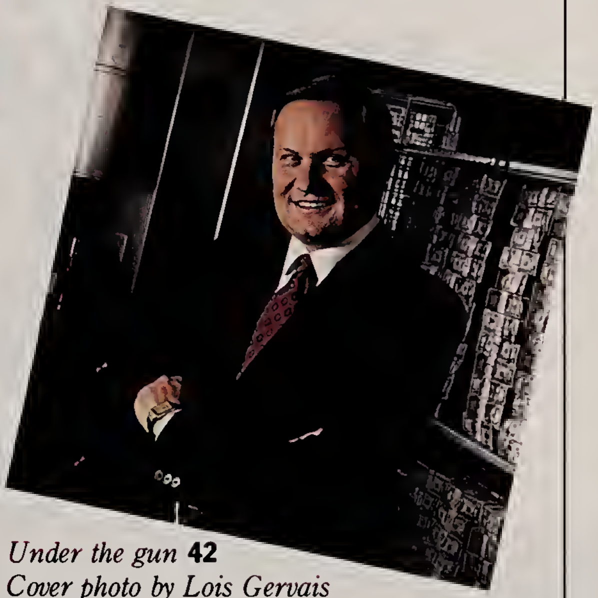
Forget multiyear time frames. Welcome to the decade of the turbocharged systems-integration project.
By David Freedman



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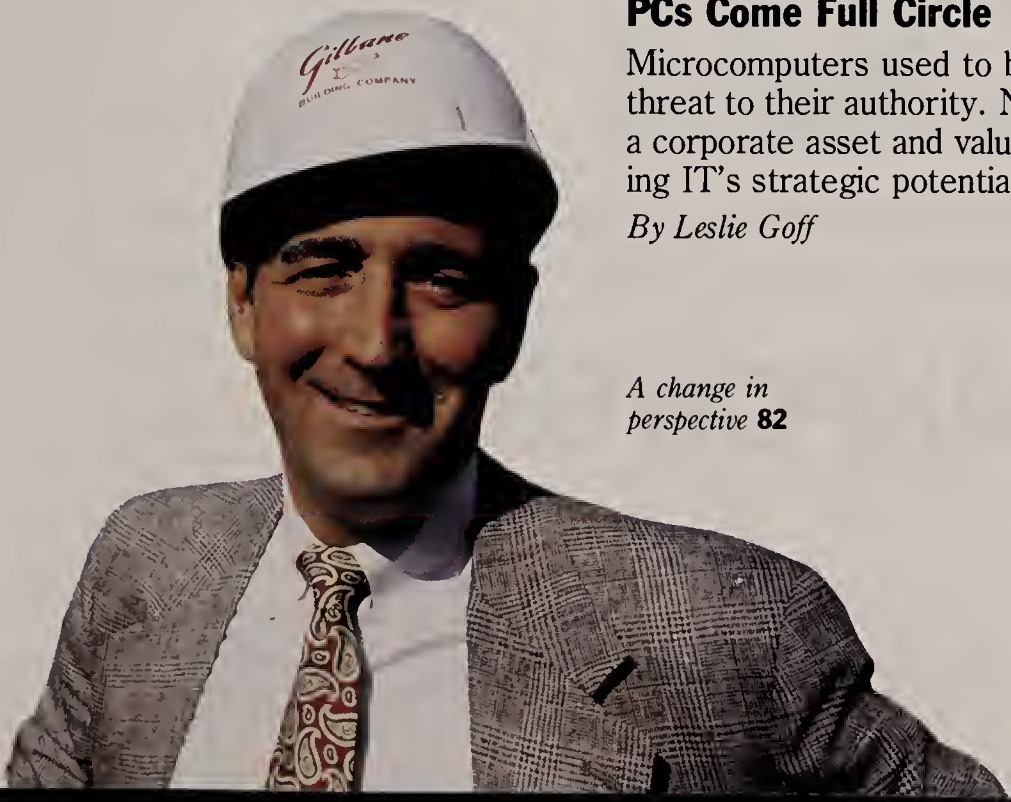

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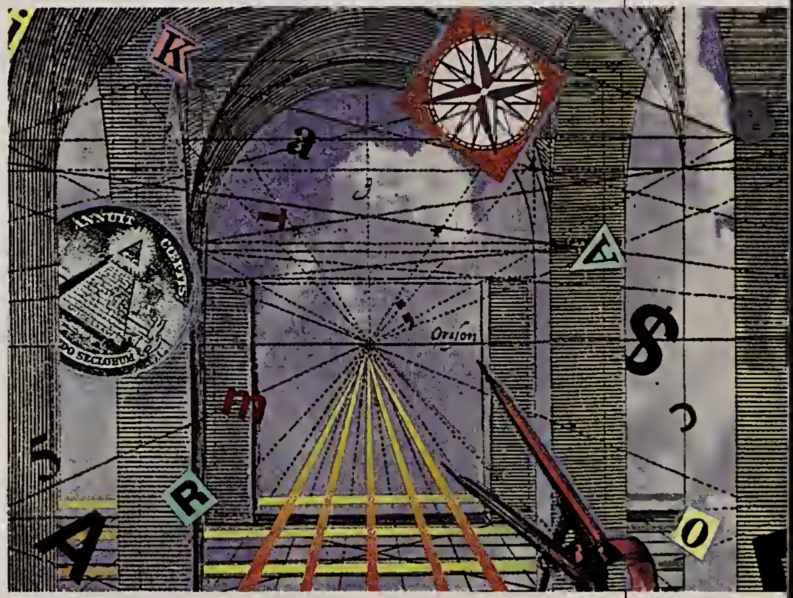

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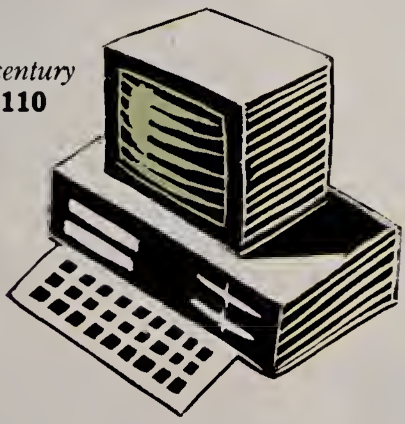

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"The IEF is a superior tool for implementing Information Engineering because it integrates the entire process from planning through code generation. We're deploying the IEF throughout the corporation."

David V. Evans
Vice President
Director, Information Systems
J.C. Penney

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Executive Vice President
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Paul R. Hessinger
Chief Technology Officer
Computer Task Group

"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

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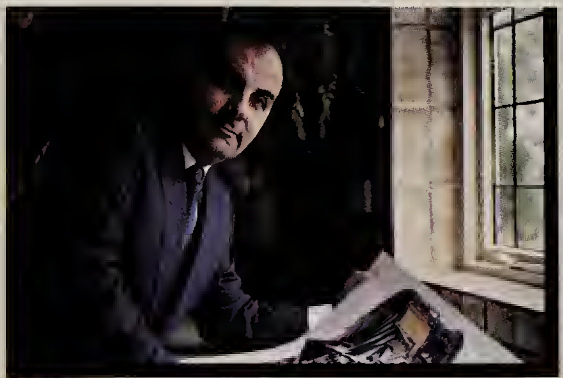
Giorgio Sorani
Division Head – MIS
Lubrizol



"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development.."

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Head of Operations, Systems/Computing
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TWA

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Mogens Sorensen
Chief Consultant
Nykredit (Denmark)

op information systems with uctivity and maintainability.

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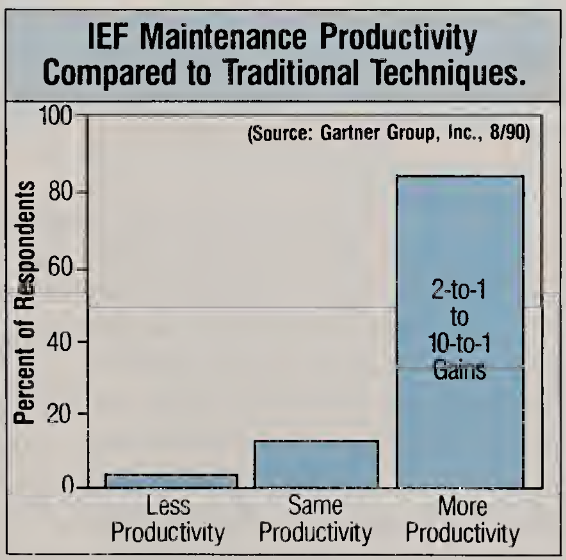
Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

Mainframe applications can be developed and tested on a PC.

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LETTER FROM THE EDITOR

While the phenomenon of CIO turnover has been reported in detail—perhaps too much detail—scant material exists on what impact the loss of the top information executive has on the IS group.

This month CIO examines the concerns of the IS group as they adapt to working with the new CIO. Not surprisingly, several IS managers agreed to reveal their experiences only if we quoted them anonymously. Generally, our magazine's policy is to identify the individuals participating in our articles, but in this case we decided to support the desire for anonymity, given the political environment of many organizations.

PHOTO BY RUSSELL WINDMAN

The response to Special Projects Editor Allan E. Alter's investigation into IS managers' survival strategies revealed a variety of tactics. One strong scenario shows political maneuvering that revolves around forging and solidifying existing alliances. Members of the technical group reinforce their clubby stance, mid-level IS managers get closer to client departments, and the first-line IS directors are caught in a crossfire—do they side with their IS troops, which could serve to ensure the status quo, or do they hitch their stars to the game plan of the incoming CIO?

The investiture of a new CIO carries a tremendous degree of insecurity and anxiety for the IS staff. Often it results in a hiatus atmosphere while the new CIO ramps up. IS staffers wonder if they will keep their jobs and whether IT priorities and technical platforms will shift.

Our article presents an organization-calming check list for the incoming CIO. Of critical importance is the CIO's ability to help IS personnel and departmental clients to absorb the change before pushing his or her own IT agenda.

On a sad note, we report that Gary Biddle passed away on September 26 in Manchester, England, while on business for American Standard Inc., where he held the position of corporate vice president of information and system technology. Gary was a member of CIO's Editorial Advisory Board and a person to whom our editorial staff frequently turned for ideas, insightful background information and thoughtful commentary. Biddle, who worked for American Standard for 32 years, was profiled in CIO's March 1989 issue. An outspoken, highly dedicated executive, Biddle was in the vanguard of IT strategies. At American Standard he was instrumental in developing and implementing the firm's three-tiered information technology architecture. He pioneered the company's just-in-time inventory-control system and developed the Portfolio Investment Management Process by which new applications were evaluated and treated as an investment portfolio.

Gary's presence will be missed among the information management community.

Marcia Blumenthal

CIO

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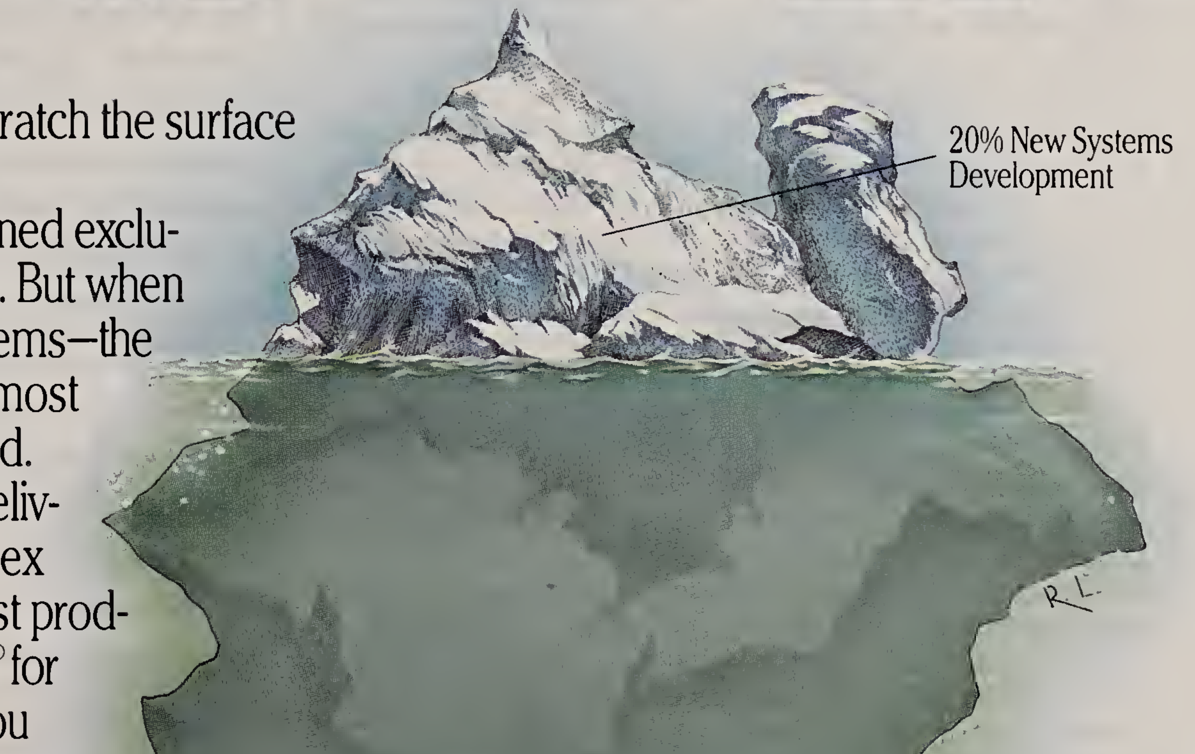

Most CASE products only scratch the surface of your development problems.

That's because they're designed exclusively for developing new systems. But when it comes to maintaining older systems—the biggest chunk of your workload—most CASE tools leave you out in the cold.

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ARTIFICIAL INTELLIGENCE

A NEW TAKE ON CLASSICAL EDUCATION

Try telling your local PTA that American schools need artificial intelligence and you're likely to be sent to the principal's office. Yet a group of researchers who are committed to improving education are counting on AI technology to change the way people learn.

The Institute for the Learning Sciences was initiated in July 1989 at Northwestern University in Evanston, Ill. Working in conjunction with Andersen Consulting, which contributes an annual grant of $2.5 million, researchers are developing three software prototypes that combine leading-edge technology and cognitive science theory with traditional and even age-old Greek learning methods.

According to Bruce Johnson of Andersen Consulting, the three prototypes currently under development are short-term projects that will form the basis of a long-term set of learning tools. "[These] tools will be used for creative problem-solving by helping students look at problems from different perspectives," he said.

The first prototype, called "The Sounding Board," uses the Socratic method in solving problems. It is designed to promote what Johnson calls "constructive wandering" by teaching students to ask their own questions and leading them to their own conclusions. The second prototype is a video-based system called "Ask Tom" that can catalog, index and retrieve interviews with experts about a particular subject. Johnson describes "Ask Tom" as "a repository of war stories in a video database," and it's primarily designed to train new Andersen consultants. "Language Learning" is the third prototype under development. It teaches foreign language through simulating everyday situations, and it is currently being developed to teach English to foreign-language-speaking Andersen employees.

"There's a tremendous amount of potential for these tools . . . in a variety of education and business applications," Johnson said.

If Johnson's right, artificial intelligence may become a teacher's favorite pet.

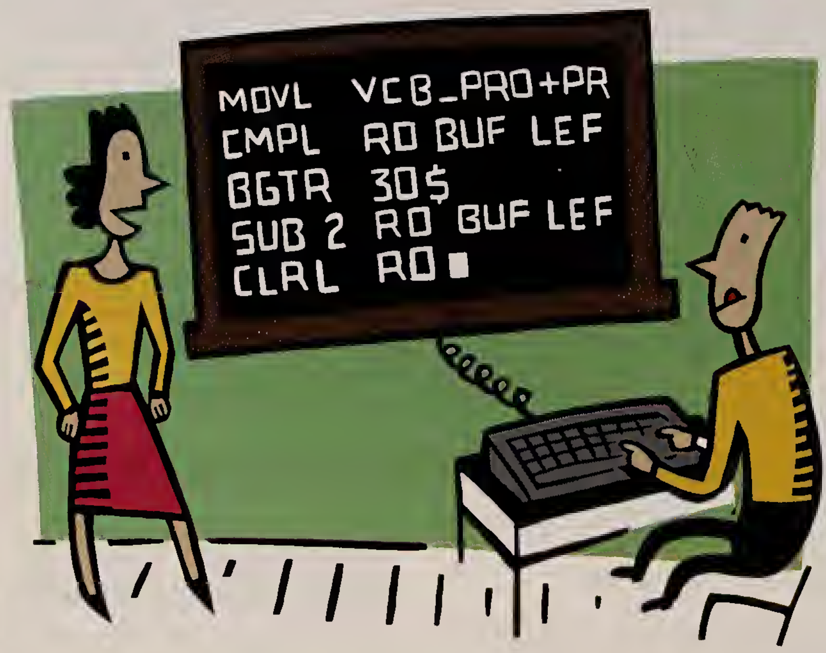


ILLUSTRATION LEFT BY ROBERT ZIMMERMAN, RIGHT BY BETHANY GULLY

SECURITY BEGINS AT HOME

Who'd ever have thought that one of the drawbacks of laptop computers, cellular phones and portable fax and copier equipment would be that they're so, well, portable? Apparently, the use of such equipment by corporate America has driven the rate of loss by theft through the penthouse roof. But companies are taking steps to stop the flow of costly office equipment through their lobbies and out the doors by installing radio-frequency-based systems under the thresholds of exits.

The system, created by Knogo Corp., of Hauppauge, N.Y., is similar to those used by retailers to protect their goods. Scanning monitors beneath the floor broadcast signals that reflect off of "soft tags" hidden inside the equipment. Generally, a building's management will install the security system. Tenants who want to participate can then purchase and install the soft tags in their own equipment.

So what happens when an executive wants to take that laptop on a business trip? He has to present an authorization pass to the security person at the door. The beeping alarm will go off anyway, but at least he won't get chased through the streets by a guard yelling, "Stop, thief!"

SOCIAL WORK

HELPING TO PROTECT CHILDREN AT RISK

On any given day in the United States, 1,849 children are abused and 178 babies less than a year old die from abuse or neglect, according to the Children's Defense Fund. Social service agencies designed to help these children and their families are increasingly overburdened as drug abuse, unemployment, teenage pregnancy and resulting child abuse increase.

After working with caseworkers around the country, Bull HN Information Systems Inc. of Billerica, Mass., recently announced the first commercially available computerized system to assist child protection agencies in managing cases and assessing risks. The Child Protection System lets caseworkers carefully track and update each case, reducing the administrative burden and allowing them to spend more time in the field helping children.

"Because the Child Protection System offers immediate and easy access to crucial information on child abuse

TRENDLINES

cases, such as family histories and related offenses, caseworkers are able to make better decisions based on more accurate and up-to-date information," said Wesley Bowerman, director at the Berrien County Department of Social Services in Michigan, which has been testing the system since late 1989. "Additionally, since caseworkers physically enter potentially dangerous households [in] deciding whether to remove a child from his or her environment, this information can make the difference in the safety of the child and the caseworker." Like many child protection offices today, Berrien County used to track child abuse cases manually, which made it more difficult for caseworkers to track and evaluate cases.

The Child Protection System includes a comprehensive risk-assessment modeling feature, which helps caseworkers determine the risk of harm or neglect to a child. Twenty-four-hour personal computer or laptop access to the system allows caseworkers to respond accurately and quickly to emergency calls.

Other features of the system let caseworkers open cases, search for case-related information on a statewide level, print documents and forms, locate foster placement, and review all the information that exists on any given case. The Child Protection System provides comprehensive scheduling information to help caseworkers plan better and allow managers to better evaluate workloads.

The system, which runs on the Bull DPX/2 family of UNIX mid-range computers, uses open systems architecture and standard protocols and can easily be connected to an agency's existing computers. Oracle Corp.'s Oracle software provides the relational database management component. The product provides strict access control through passwords and user authorizations. ■

NEURAL RESEARCH

SLUGS FOR SCIENCE

Many people lament the fact that the computer industry is getting more sluggish every day, but, for some, this is not necessarily a bad thing. Researchers at a few labs around the country and in Japan have turned to the most unlikely of subjects—the common garden slug—in hopes of unlocking the mysteries of artificial intelligence.

It's not that the slimy critter, known in official parlance as Limax maximus, has cognitive abilities rivaling those of Einstein. Rather, the attraction for researchers seems to be that slugs have a remarkable sense of smell paired with a central nervous system composed of only 500,000 neurons, which is relatively uncomplicated compared to conventional lab animals. A team of neuroscientists at AT&T's Bell Laboratories in Murray Hill, N.J., have discovered the neurological link between a slug's nose and the olfactory receptor area of its brain. By tempting slugs with some of their favorite foods and then pairing the odors with repellent chemicals, researchers can actually train the garden slugs to modify their behavior—and observe how their neural networks work in the process.

In a typical experiment, scientists first present a slug with the enticing aromas of mushrooms, potatoes and carrots to see how its brain reacts. Then the slug is given a whiff of a bitter chemical (quinine is particularly offensive to the gastropods), so the scientists can see how its brain reaction changes. The end result of associating a pleasant odor with an unpleasant one is that the slug actually seems to learn to reject and avoid the foods it once avidly devoured.

By studying the neural network that controls the feeding process, right down to the individual neurons that decide whether a taste should be accepted or avoided, scientists hope to be able to map the neural transmission patterns of slugs. They believe that such patterns can then be used to develop computer software that can recognize and select information in much the same way a police scanner reads radio signals.

Although the initial findings are promising, the payoff in terms of developing any actual applications is years away. "Experiments have been going on here since 1982," said Russ Glover, a spokesman at AT&T's Bell Labs. "This is long-term basic research, and we don't expect conclusive findings for some time."

Now, who ever said that slugs didn't have much to offer? ■

CAREER MOVES

ROBERT HANSON has been named executive vice president and chief information officer for the Burlington Northern Railroad Co. Hanson, who is the railroad's first CIO and will be based at company headquarters in Fort Worth, Texas, was previously a managing principal at Nolan Norton & Co. in Lexington, Mass. BROCK T. STROM, formerly a vice president, has been promoted to senior vice president in the Information Systems Services Department in St. Paul, Minn., and will report to Hanson.

DAVID CHRISTIAN has been appointed to the position of vice president of management information systems at Days Inns of America. Christian joins the company from Dun & Bradstreet Software Services in Atlanta, where he served as vice president of information technology & services and as director & vice president of the corporate information & services divisions. ■

ILLUSTRATION BY ROBERT ZIMMERMAN

TRENDLINES

DATA TRANSMISSION

CREDIT CHECKS BY TV

Thanks to the folks at public television, merchants will soon be able to run speedier, less-costly checks on customer credit cards.

PBS National Datacast, a for-profit subsidiary of the thinking person's television station, and VeriFone Inc., a Redwood City, Calif., maker of transaction automation systems, have teamed up to provide point-of-sale credit-card information over the airwaves. Beginning in 1991, PBS will use a portion of its unused broadcast signal, known as the vertical blanking interval (the black bar you see when your TV picture rolls) to daily transmit encoded credit-card or check information, provided by plastic coin giants like VISA International. PBS's 338 local member stations throughout the nation will pull the signal down from a satellite and carry it in the black band of their own broadcasts.

Merchants will be able to capture and use the information through a service marketed by VeriFone to local transaction-processing agencies. Using a receiver alert to the VBI signal, these agencies will capture the pertinent information and make it available to credit-wary merchants. Since most merchants now use systems that require a long-distance call for nearly every credit-card check, PBS and VeriFone assert that their alternative scheme will provide customers with faster, less expensive service. A VeriFone spokesperson insists that the "VeriCast" service should be attractive to large outlets that have long considered credit-card checks to be too slow and costly—chains like McDonald's and Wendy's, for example, which took part in beta tests last year. But VeriFone has not yet decided how much to charge for the services.

Mike Garr, vice president and deputy general manager of PBS National Datacast, noted that the idle portion of the signal (originally used by broadcasters in the days of duller technology to help keep TV pictures in synch) could carry other kinds of information, too—including graphics and text for home electronic-mail services. In 1992, PBS hopes to use the VBI for on-screen TV information to subscribers. "Basically, VBI is a data pipe," Garr said—one that PBS intends to exploit in order to garner revenues.

YOUR BUILDING, YOUR HEALTH

Imagine you go to work one day and encounter a motley crew of scientists and technicians sampling the air in your building and peering into your ventilation ducts. You soon discover that their mission is to discern whether your building is sick or well.

Sound like a gag? A practical joke?

Think again. Healthy Buildings International Inc., an air-quality inspection and consulting firm based in Fairfax, Va., claims that more than half of the major structures in the United States are plagued by indoor air pollution. "Sick" buildings make for sick employees—and inflated absenteeism costs. Moreover, employees have begun to take their "sick building syndrome" cases to court. In 1988, a California man who claimed that his central nervous system was damaged by exposure to toxic substances in his office won $650,000 in a settlement of his case.

Based upon their inspections of over 400 major buildings in the United States, HBI figures that the most common causes of indoor pollution are poor ventilation, inadequate filtration and simple neglect (or poor operation) of the building's air-flow systems. In any of these cases, employees become subjected to increased levels of bacteria, fungi, dust or other nasty airborne junk. HBI says a building is diagnosed as "sick" when more than 20 percent of the employees working in it complain of headaches, fatigue or irritation of the eyes, nose or throat—and that these symptoms vanish like a dust mote in the breeze after the employee exits from the building.

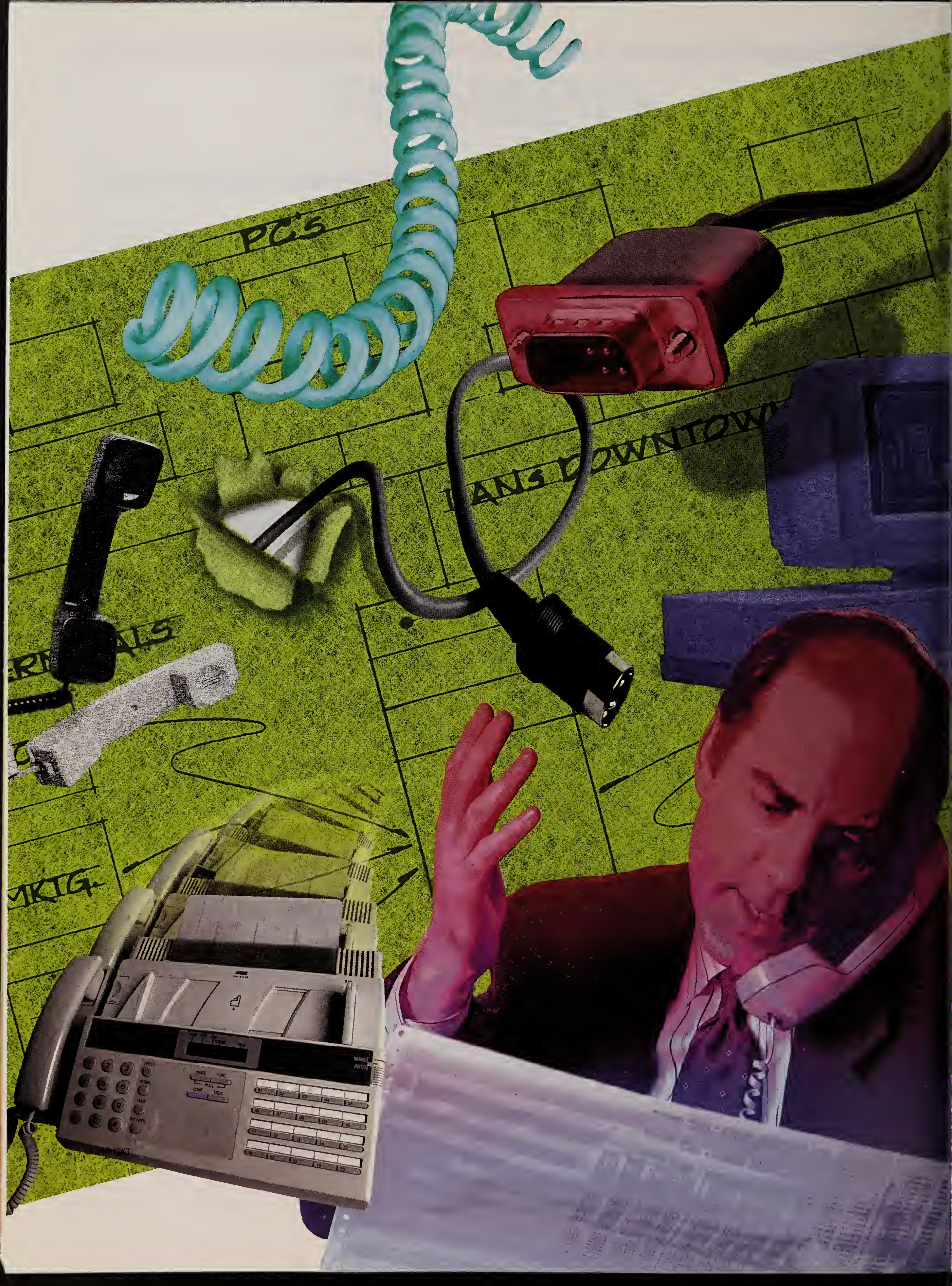
HBI offers its clients both an ounce of prevention and a pound of cure: The company will inspect and clean existing systems or work with architects and building planners to design systems for new constructions.

THE TORTOISE AND THE HARE?

Though it is commonly believed that the United States will face a disadvantage when trying to access European markets at the dawn of EC '92, at least U.S. executives will have the advantage of speed. A majority of both U.S. and U.K. executives interviewed in a survey recently conducted by the financial and IS recruiting firm of Robert Half International believe that Americans work faster than their British counterparts. Fifty-one percent of British execs and 64 percent of Americans from leading corporations in both countries said that Yanks work faster. "Americans honor the newest and fastest way to get the job done," concluded Max Messmer, chairman of Robert Half. "In contrast, British culture is based on respect for tradition, thoroughness, stability and understatement." But does slow and steady win the race?

ILLUSTRATION LEFT BY ROBERT ZIMMERMAN, RIGHT BY BETHANY GULLY

Your local phone company
understands what the real world
is like...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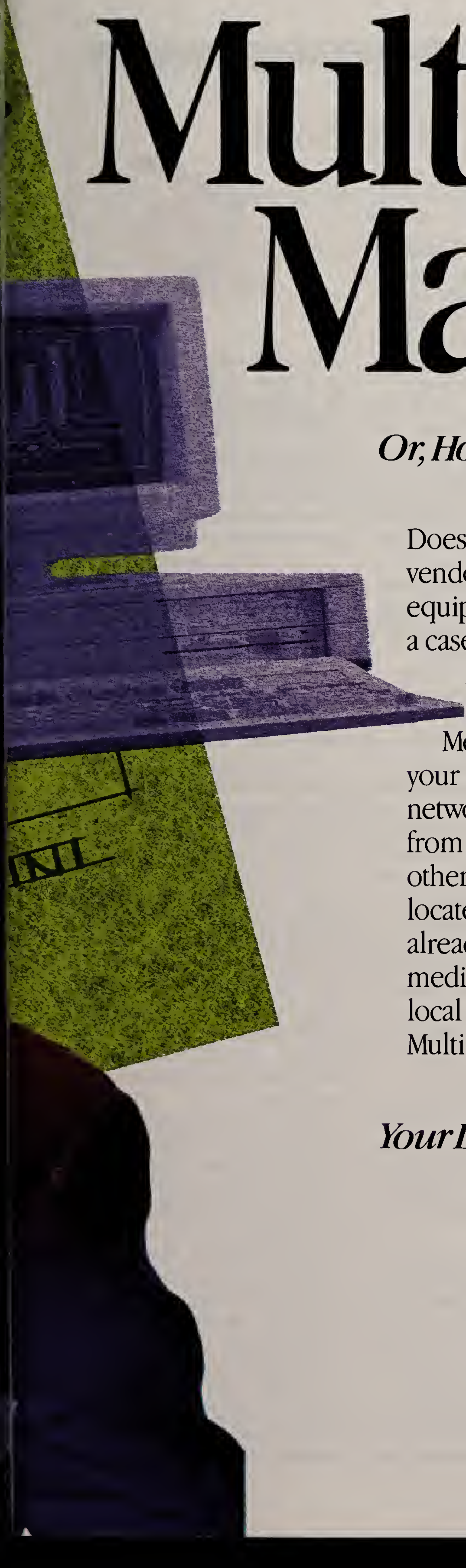


Multi-Vendor Madness

Or, How To Tie Your Networks Together And Regain Your Sanity.

Does your state-of-the-art equipment from one vendor refuse to talk with your state-of-the-art equipment from other vendors? Then you've got a case of Multi-Vendor Madness. But it is curable.

AT&T Network Systems has the remedy. The AT&T 5ESS® Switch and Bell Labs designed Metropolitan Area Networking can be used by your local phone company to interconnect your networks. This system can make your equipment from one vendor talk to your equipment from other vendors. No matter where that equipment is located. And it does it over the phone lines you already have installed. It's not snake oil. It's real medicine. Scientifically proven to work. With your local phone company and AT&T, you can make Multi-Vendor Madness a thing of the past.

Real-World Solutions From Your Local Phone Company and AT&T

AT&T
Network Systems

TRENDLINES

COMPUTER MATING

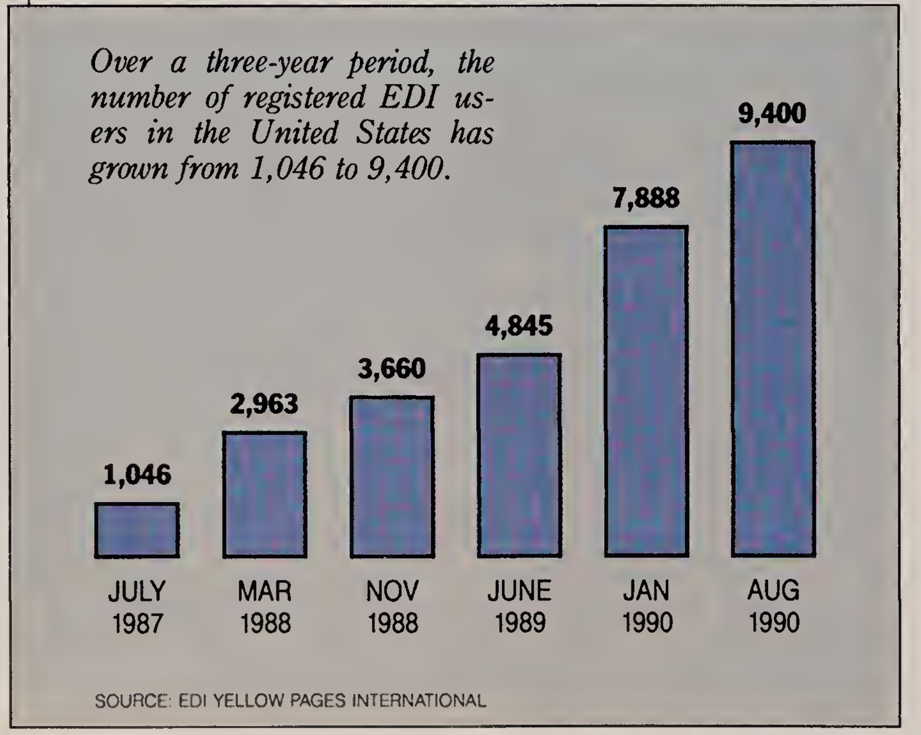
For Holstein cows, matches aren't made in heaven; they're made in Brattleboro, Vt. That's where the Holstein-Friesian Association of America, the world's largest breed registry association, operates its computer mating service.

The Association's MIS department stores 108 years of genetic information on more than 14 million registered Holstein cattle. Holstein farmers use its databases to locate the perfect match for their Holstein cows among the 2,000 Holstein bulls used for breeding. According to Director of MIS Grover M. Robinson, the Association's service considers over 30 physical and milk-production characteristics. For example, if a cow has weak legs, the computer will search for a bull with especially strong legs. The system also checks to ensure that the bull it recommends is not closely related to the cow. The association is now implementing a system to gather data on the cows right at the farm using hand-held terminals.

This is bound to keep the Holsteins happily (and healthily) productive—now what about all those lonely-hearted Herefords out there?

ELECTRONIC DATA INTERCHANGE

STEADY GROWTH

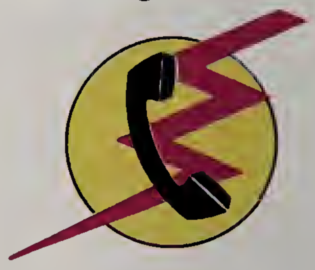


Over a three-year period, the number of registered EDI users in the United States has grown from 1,046 to 9,400.

SOURCE: EDI YELLOW PAGES INTERNATIONAL

VOICE MAIL

SERVING THE SALES FORCE



Vendors of voice-mail systems have long bemoaned the fact that customers rarely use their systems for much more than taking and leaving messages. Some companies, however, are getting a pretty good bang for their voice-mail bucks. Val-Pak Direct Marketing Systems Inc. in Largo, Fla., for example, is using voice mail to disseminate business intelligence and sales support to its franchisees' sales forces. Salespeople who subscribe to the service now have 24-hour-a-day access to ScoopLINE, the company's voice-mail-based news service. ScoopLINE is accessed by a toll-free number connected to a touch-tone-driven voice-response menu, which directs users to a number of different voice-mail boxes.

Maintained and updated almost continuously by an editor with a staff of four, ScoopLINE spreads the word on successful couponing campaigns and serves as a case-study forum to analyze why particular sales efforts might have failed. Different voice boxes offer a variety of services. For instance, a daily bulletin provides two- or three-minute reports that include selling tips, sales leads and industry trends. Sales-call briefings relay information to salespeople that is pertinent to the particular sale they're trying to make.

A third offering gives Val-Pak salespeople a list of the funds that manufacturers provide retailers to support local promotional efforts, while others are reserved for competitor, customer and marketplace intelligence-sharing. Val-Pak's corporate officials use one ScoopLINE channel to tell sales personnel about company sales contests and bonus programs. And salespeople looking for sample coupon designs or similar items can use the ScoopLINE system to request that such materials be transmitted to them by fax.

ScoopLINE is the brainchild of Joe Bourdow, national training director for Val-Pak (a mass-market distributor of coupons by direct mail) and a partner in the company's Richmond, Va., franchise. It was built and is run by the Richmond branch of Voice-Tel Enterprises, a vendor of voice-messaging services headquartered in Hudson, Ohio. Bourdow initially created ScoopLINE for his local sales force, where it "revolutionized our business," he said. The Val-Pak corporate organization then adopted the service and has been selling it to salespeople companywide since January. By the end of August, 250 of the company's 1,000 salespeople had subscribed, and two or three more have signed up every week since.

Voice-Tel has provided bulletin-board-type voice-mail services for other clients in the past, according to marketing director Bill Stephens, but this is by far the most intricate such effort to date, involving a combination of broadcast messages, customized voice responses to individual queries, and fax. "ScoopLINE is just one example of how voice mail can be applied to situations other than for leaving messages," Stephens said.

ILLUSTRATION BY BETHANY GULLY

CIO

November 1990

"Executives must come to grips with the fact that the inability of traditional approaches to turn out effective strategic information systems, in the exceedingly short time frames critical to their success, threatens to throttle even the most promising opportunities."

Professor John J. Donovan
Chairman and CEO
Cambridge Technology Group

Dear Executive:

The strategic management of Information Techology has indeed become *the* essential element for business survival. In today's volatile economy, technology as a strategic resource must be employed at *all* levels of the organization ... from marketing and manufacturing to human resource planning, in addition to the more traditional applications.

Information Technology not only enables companies to create a more effective, more responsive business environment; it has also bred potent enterprises capable of generating and speeding new products and services to market and eclipsing their competition.

To general managers and technology executives, the strategic use of Information Technology is the discipline of the future. And those executives who fully realize the enormous business potential of IT are best positioned to harvest the rewards.

With this in mind, *CIO* Magazine invites you to attend *CIO Perspectives*, a three-day executive conference, March 10-13, 1991, at Amelia Island Plantation, Florida. *CIO Perspectives* will focus on the strategic use of Information Technology to maximize profits.

To those of you who have participated in previous conferences, we look forward to seeing you again and discussing the most critical issues facing CIOs. For those of you who have not yet attended one of our programs, we look forward to welcoming you and to sharing a few fast-paced, educational and profitable days.

For more information, please call Lori Cardarelli or Diane Martin at 800/343-4935.

Sincerely,

Joseph L. Levy
President and Publisher

CIO Publishing Inc. 492 Old Connecticut Path P.O. Box 9208 Framingham, MA 01701-9208 508 872-8200

Coming in CIO

The Buddy System

Faced with a declining public education system and fewer students interested in math and science careers, businesses and schools are forming partnerships to improve scholastic opportunities and insure an educated workforce for the future.

Rebuilding the Business

IT increasingly enables and supports a company's efforts to re-engineer the way it conducts its business. What role does the IS department play in this process?

Expert Systems Update

Now that expert systems have been at work in the real world for a while, what lessons have been learned?

Cooperative Processing

If your mainframe or minis are linked to PCs, you're probably spending more time, money and processing power than you need to and getting less integration and ease of use than you should. Cooperative processing can change all that.

Station Identification

The X.500 global directory will enable users to reach out and touch anyone with an electronic address, be it E-mail, fax or telex

BY DR. DONALD P. CASEY

X.500 is the latest in the lexicon of telecommunications buzzwords that any self-respecting CIO must have in his or her arsenal. But what's really behind the terminology?

X.500 is a "code" term for a set of agreements put together by the Geneva-based Consultative Committee on International Telephony and Telegraphy, or CCITT, the international telecommunications standards arm of the United Nations. X.500 provides a "blueprint" for implementation of a global directory containing information about users of electronic communications services and the resources associated with such services.

In its most interesting implementation, this directory will be distributed, with information about a user spread across a number of environments. For instance, E-mail addresses may be in one database, telephone and fax numbers in another, and postal addresses in a third. But it is more feasible to speak of "The Directory" rather than of multiple directories when taking the global view of all the information that will be available.

When implemented, the Directory will remove one of the frustrating barriers we face in inter-company electronic messaging. Up to 1989, most public E-mail systems operated as isolated islands of communication. This year, however, the industry made great progress in bridging these islands. The proliferation of X.400 interoperability agreements enables Western Union subscribers, for example, to reach subscribers on AT&T Mail, IBM-IN, GE Information Services, SprintMail, MCI and BT Tymnet. Announcements of interoperability certification with other networks and international destinations are occurring on almost a daily basis.

A major obstacle to connectivity for users on third-party networks has been breached, and the public E-mail carriers are now able to bring people and applications together regardless of their personal choice of public E-mail vendor.

However, we still face the task of removing the last obstacle to communication: finding an address in a simple way. That's what the X.500 Directory will do. Once in place, the user will be able to reach anyone who has an electronic address (mailbox, fax, telex) by initiating a search and retrieval through the directory.

That's what global businesses need. Until electronic mail becomes as easy to use as a facsimile machine, it will always fall short of its promise. The X.500 Directory will provide that ease of use.

The most difficult part of developing the Directory stems from its nature as an all-encompassing database. X.500 is extremely complicated to implement and manage, and even though an initial set of standards was adopted in 1988, the CCITT is continuing to work on additional important definitions and design decisions that will become part of X.500.

Apart from the technical development, other issues will require solutions before a genuine global X.500 Directory can be put in place.

First among these is cooperation. The situation is equivalent to the administration of a physically distributed information system with manage-

ILLUSTRATION BY BOB HAMBLY

ment responsibilities shared by a number of competing organizations. The X.500 Directory will require clear delegation of responsibility.

Beyond management, the cooperation issue includes a willingness on the part of competitors to share some level of knowledge about their own customers. The Western Union Directory, for example, won't be able to locate a subscriber of another system unless the competing service provides access to the subscriber's electronic address.

The level of cooperation extends far beyond the public service providers. Large and small corporations will want to be part of the X.500 Directory. But they have to decide how much information they will share with the outside world about their employees, their communications devices and their applications. As corporate E-mail systems proliferate, the question is: Can we afford to perpetuate "iron curtains" around the users?

To be useful, the X.500 Directory should be able to locate a correspondent, no matter what electronic communications service that correspondent uses. Ultimately, the Directory is going to need help to know where to search efficiently for the needed information. Otherwise, queries will use up too many resources searching for information on multiple databases.

If the system is to work, we need to penetrate the barriers around corporate systems. One can almost hear the hue and cry now: "Why should we open our corporate system to a flood of useless E-mail?" or "How much information is realistically required? What kind of security will there be to protect corporate systems from hostile incursions?" After all, normal corporate directory databases often contain far more than communications addresses. Personnel files, for instance, certainly can't be made accessible without some controls.

One industry concern currently making the rounds today centers on the possibility of headhunters accessing the Directory to satisfy particular search requirements. This concern stretches the bounds of reality. It does illustrate, however, that since appropriate safeguards can be built into search criteria, cooperation is the keystone to facilitating inter-company messaging throughout the business world.

It will undoubtedly make sense to limit calls in particular circumstances, but the benefits of being able to reach and be reached by others outweigh the perils of easy access to directory databases. The issue of security can and will be addressed through network administration. To achieve the promise of X.500, corporate directories need to be part of the global X.500 Directory.

Public E-mail carriers are now able to bring people and applications together regardless of their personal choice of vendor. However, we still face the task of removing the last obstacle to communication: finding an address in a simple way.

Most of the big players in public E-mail and messaging electronics had a hand in developing the X.500 standards, with their overseas correspondents as participants in the CCITT committees. Once the value-added networks (VANs) started interconnecting their electronic mail systems in North America, the need to accelerate the development of a global X.500 Directory was obvious. It's one thing to have a set of agreements on the protocols to be used for a Directory. It's quite another thing to put flesh on those guidelines.

Earlier this year, Western Union issued an invitation to its interconnected competitors and partners from North America to sit down and address the practical issues of working together to construct the Directory.

Out of that invitation, a Directory Forum emerged. There were 19 member firms at last count, all of which are involved in electronic messaging and/or directory services. The industry is attacking the issue head-on before it becomes a critical problem in the marketplace. Discussions thus far have been cordial and very open, despite the fact that we are direct competitors.

If our intent is to provide a truly global Directory, why have we focused our attention on North America? The answer is relatively easy—that's where most of the public electronic mail "action" is now. That is where the full weight of a distinct Directory will fall first. In order to get a clear picture of the issues and start the development of a real Directory, we had to limit our focus.

Most of the problems will be the same no matter where the Directory operates (language and character codes aside). But the urgent need for a solution exists today in North America. Directory Forum solutions will be transferable to other electronic messaging environments in Europe and the Pacific Rim.

Although the need for a global X.500 Directory is compelling, delivery of a viable solution is still a futurist's scenario. It is likely that 1991 will be an important year. Prospects for a working product look good, although full functionality may not occur before 1993.

In the meantime, each service provider will try to meet its own customers' needs. The X.500 Directory Forum may come up with some interim solutions if cooperation remains at its present high level. Members of the Directory Forum recognize the strategic importance of the project and will move as quickly as possible to insure its speedy implementation.

Dr. Donald P. Casey is the director of external affairs for Western Union's Business Services division in Upper Saddle River, N.J.

In a world that changes economic systems overnight, can we really afford personal computer systems that take weeks to set up, months to learn, and years to deliver on their promises?

No. But, fortunately,
afford a

In the 1980s, American companies invested nearly $90 billion in PCs, yet office productivity has shown disappointing gains.

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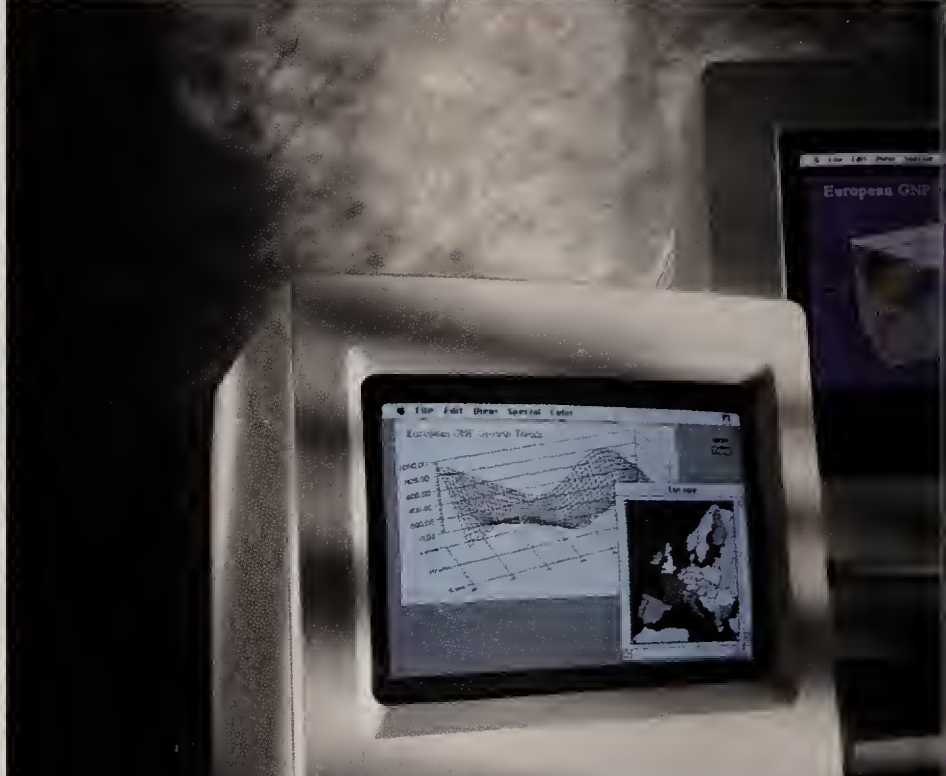

The new Macintosh Classic, Macintosh IIsi, an

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* *The figures are included in a 1990 study conducted by Diagnostic Research, Inc., among Fortune 1000 managers and business computer users familiar with Macintosh and MS-DOS or Windows systems. Call and we'll send you Macintosh, and "The power to be your best" are registered trademarks, and SuperDrive is a trademark of Apple Computer, Inc. MS-DOS and Windows are registered trademarks of Microsof*

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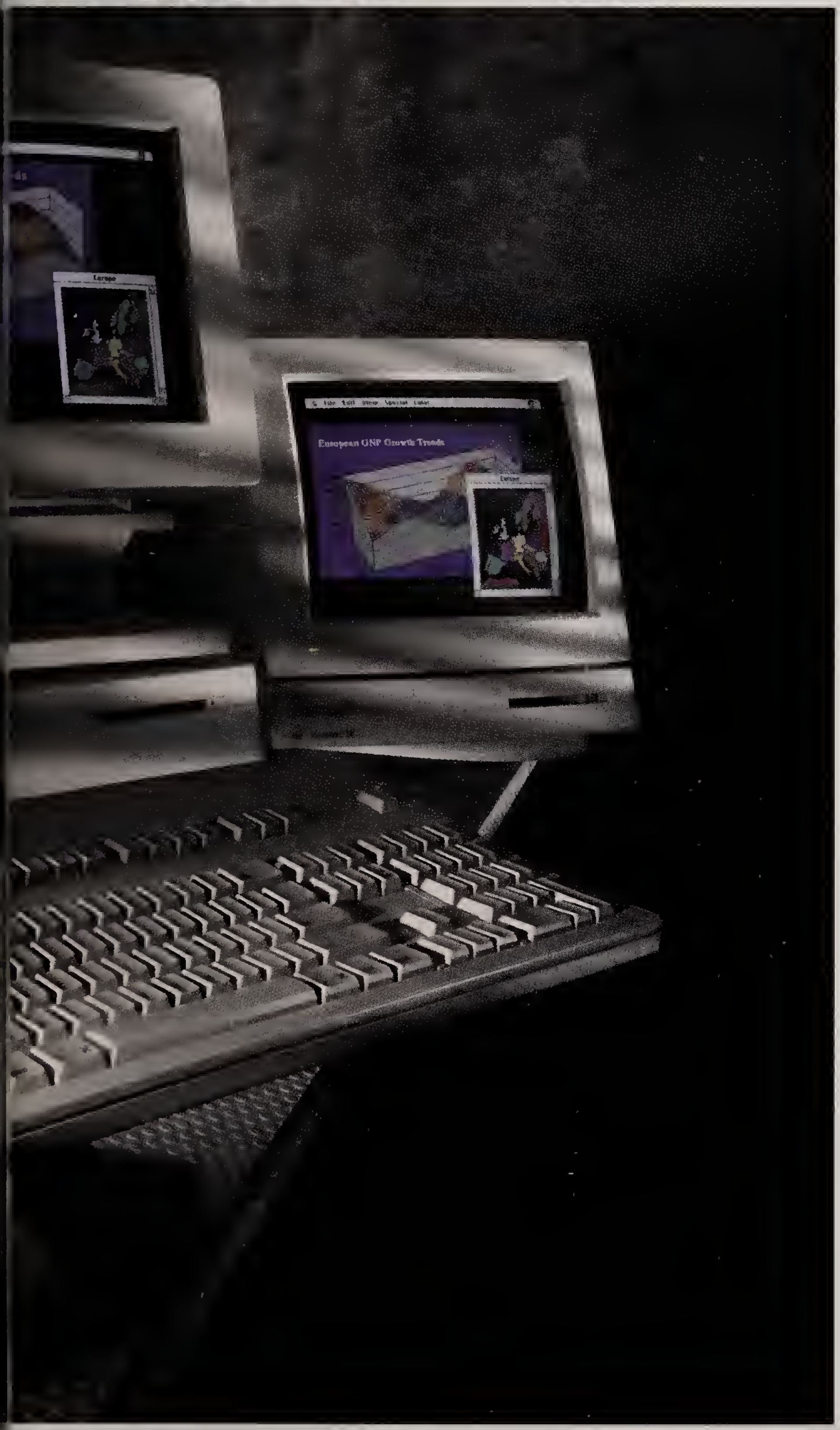

Macintosh LC on stage together for the very first time.

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The Macintosh IIsi.

Running a 20 MHz 68030 microprocessor, the new Macintosh IIsi delivers serious number-crunching at the most attractive possible price.

Into its sleek package are compressed the powerful essentials of the Mac II line. Including an optional 32-bit NuBus™ slot for high-performance graphics and accelerator cards. Along with advanced networking systems like Ethernet and Token-Ring. Plus a 40 or 80MB hard drive. Built-in video chips drive four different Apple monitors.

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Wising Up

Disillusioned by IT vendors' extravagant promises for their products' capabilities, businesses are taking to heart the directive 'buyer beware.' Now vendors must learn to muzzle their hyperbole and help companies set more realistic expectations.

BY MIKE BOSWORTH

Sales of computer hardware and software continue to lag behind the industry's predictions and expectations. While many experts point to the usual causes—foreign government price supports, difficulties in technology development and a slow economy—I believe a key factor has been overlooked. And that factor is the shift in market receptivity to the promises of information technology vendors.

A system of sales-bolstering beliefs lies shattered. Buyers used to view the computer as a "high-tech miracle" that could solve all kinds of problems for ailing businesses, boosting profitability, productivity and market share while eradicating customer-service problems. Today, however, businesses realize they still have the same problems that the expensive systems they bought four or five years ago were supposed to solve. For example, companies that purchased MRP systems were told by vendors that "the system" would lower inventory levels, improve customer satisfaction and eliminate shortages. Yet industry gurus say that only 3 to 5 percent of the companies that made such purchases were actually able to achieve all of these results simultaneously.

Because buyers were told, "no problem, we can take care of that for you," they didn't stop to think that running the business and making the stocking, purchasing and fulfillment decisions would still be their responsibility. They held the vendor responsible for solving the problems he promised to solve. So they have become skeptical and reluctant to buy.

We can't place all of the blame on the information systems industry. Buyers contributed to the situation by looking for an easy way out of their problems and abdicating the responsibility of running their own businesses.

CIOs—as both buyers and (internally) sellers of information systems—are also to blame. Many CIOs have taken the vendors' promises and turned around and created unrealistic expectations within their own companies. When line vice presidents go to MIS with a problem, they are too often told, "no problem, we can take care of that for you."

To turn this situation around, those selling information systems—whether internally or externally—need to dramatically change their selling approach. They need to accept that the system is not the solution. Rather than saying, "Our solution will give you . . . ," sellers should be saying, "Our product will give you the information you said you needed to solve your problem." At the same time, buyers need to beware of "miracles."

ILLUSTRATION BY BLAIR THORNLEY

Technically, It's An Architecture. But It's Really Something Else.

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Freedom. tenets underlying the most advanced, and independent architecture ever developed.

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One of the key things I teach is an understanding of the three levels of need that exist in the buyer's mind. They are:

- **Latent:** The seller or CIO sees the need, but the buyer or user does not. These needs have either been ignored or rationalized.
- **Pain:** The buyer or user acknowledges a problem but does not know how to solve it.
- **Vision:** The buyer or user sees how he can solve the problem, takes responsibility for solving it, and understands what capabilities he needs to solve it.

Our organization teaches vendors to "process" the needs of their prospects. This means leading prospects from a latent need through admission and understanding of a problem (that the vendor believes he can help solve), to a mental vision of the solution that includes the capabilities of the products and services being sold. The objective is for the buyer or user to see himself solving his own problem rather than thinking that the vendor or MIS professional is going to solve it for him. By helping the buyer focus on the desired functionality needed, you avoid the distraction of irrelevant, technology-related objections and can continue with positive momentum toward solving the business problems.

Need processing is a three-step process. First the problem must be "diagnosed." Ideally, this is done with a bias toward the capability the IS vendor has to offer. After the buyer gives his understanding of the problem, the vendor supplements the problem definition with closed-ended questions.

Next the potential negative impact on other key people in the company must be explored. Again, the buyer must first be allowed to give his version before he is led elsewhere.

Finally, the vision is created. The buyer is first asked an open question: "What would it take for you to be able to solve this problem?" Note how the responsibility is placed on the buyer. Then the vendor can try some "what if you were able to . . . " questions that are intended to make the buyer a "mental user" of the proposed system. The key is to get the buyer seeing himself acting on the problem.

The most difficult part of need processing is asking the right closed-ended question at the right time. Unfortunately, many IS salespeople do not have the industry, product, business and data-processing knowledge to do this. Sellers eventually acquire this knowledge, but it takes too much time. Our approach to this problem is to get the vendor's product and industry specialists to write tactical sales tools we call "pain sheets." First they identify every significant job title affected by the products and services for each vertical market. Next they list the high probability pain areas the products and services are designed to address. Third, they write specific, situational, closed-ended questions that help diagnose the problem, explore impact and create the vision.

> *The objective is for the buyer or user to see himself solving his own problem rather than thinking that the vendor or MIS professional is going to solve it for him.*

With these tactical sales tools, many IS vendors not only dramatically shorten the learning curve for their salespeople, but they also ensure that their products and services are positioned consistently and correctly across the sales force. By using the need-processing approach, these companies also make sure that their prospects assume responsibility for solving their own problems. The prospects come to view the vendor's products and services as essential to that solution. In other words, it's a win/win situation.

Expertise can be a vendor's or CIO's enemy. Sellers of information systems need to stay in alignment with their buyers. The number-one reason for the lack of success in implementing information systems is that the seller was at the "vision" level while the buyer was still at the "pain" level. With the benefit of past experience and technological knowledge, it's much easier for an IS vendor or an MIS professional to visualize a problem's solution than it is for the person with the problem. If the buyer cannot yet see how to solve the problem and the seller has credibility, it is very easy for the buyer to give up his responsibility. By staying in alignment, the seller can help the buyer create a vision of solving the problem.

When "selling" systems internally, the same process applies. The three areas of training I recommend for salespeople will work in any CIO's situation. First, you need to understand the specific situations and problems you will encounter in each department of the company. Second, focus on how system capabilities align with the needs you hear instead of focusing on the hundreds of product features available. Remember that you are "selling" to non-experts within the company. And third, work on helping your company's departments more clearly define their problems, retain responsibility for solving them, and understand what capabilities they will need to solve them.

Information systems vendors, and CIOs selling internally, must put their enthusiasm in their pockets and stop unintentionally taking responsibility for business problems over which they have no authority or control. As a buyer, anytime the CIO hears, "no problem, we can solve that for you," a red flag should go up. Don't let the vendor inadvertently take responsibility, because this is a recipe for failure. By helping the departments you work with to set realistic expectations, you can program them for success. CIO

Mike Bosworth is founder and president of Mike Bosworth Associates, a sales training and consulting organization headquartered in Rancho Santa Fe, Calif.

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Keyboard: 101-key enhanced layout.
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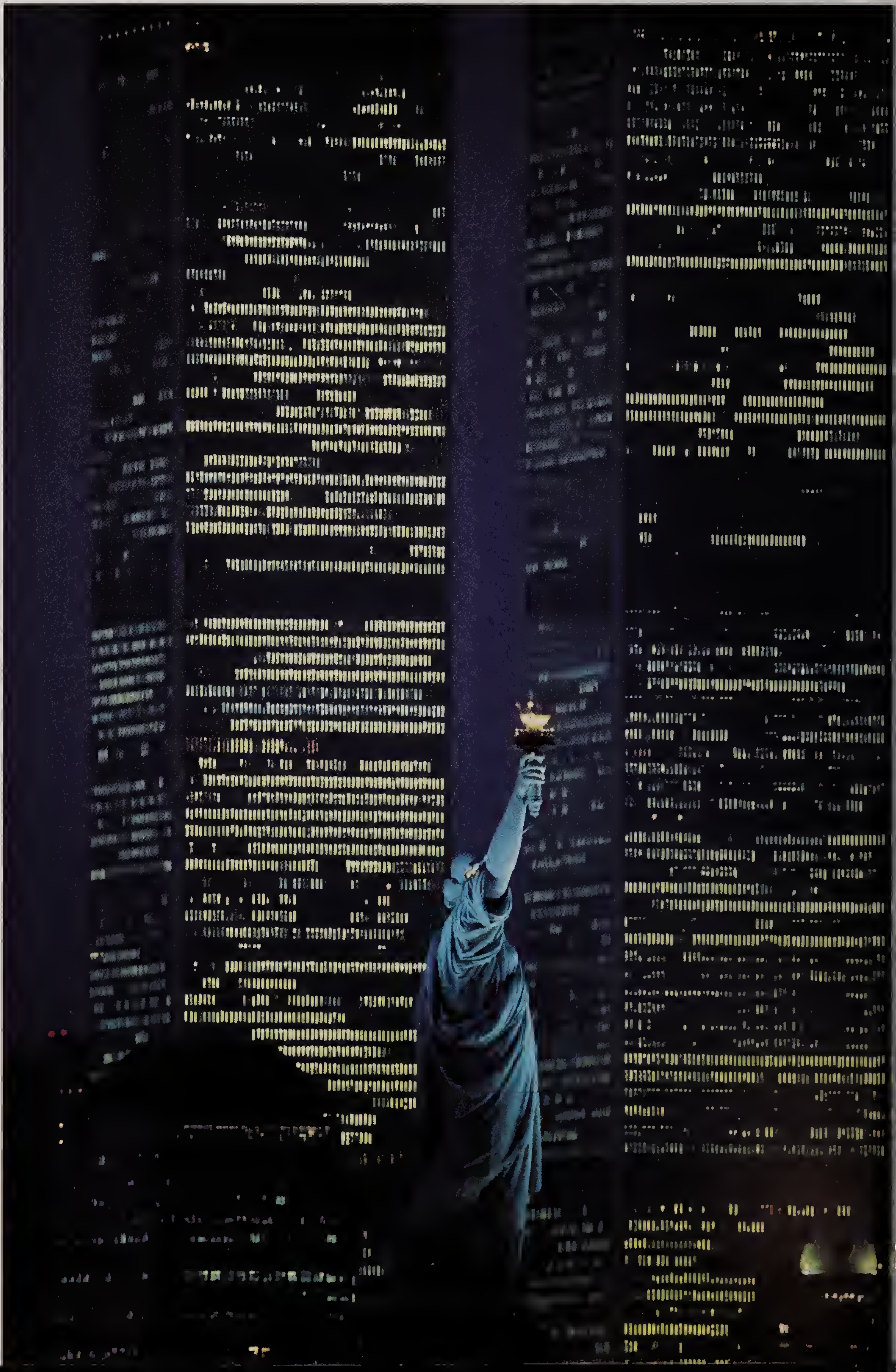

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Plotting the Future

IBM's SystemView, more the framework of a new architecture than a deliverable product, embodies a systems management strategy to assist customers in planning, coordinating and operating their information systems

BY MARIO M. MORINO

An executive responsible for managing one of the world's largest IBM-based networks, which comprises multiple large mainframes, numerous midrange computers, over 1,000 workstations, hundreds of LAN servers, and thousands of terminal and PC network nodes, has made his position clear to his hardware providers: "If I can't measure and manage the technology, I'm not going to buy it!"

Almost every IS manager with whom we have come in contact has expressed a related concern—the need for enhanced IS cost-control and -containment capabilities, combined with increased overall IS service levels. Thus, the phrase "do more with less" epitomizes the management attitude of the 1990s, and it appears that it's here to stay.

Has IBM heard this call from the marketplace? On September 5, 1990, IBM took a formal step to respond to these market challenges in announcing SystemView, its vision for systems management, as part of the System/390 announcement.

SystemView is a strategy, not a deliverable product. It forms the framework for a new systems architecture. According to IBM, SystemView is "a systems management strategy designed to assist customers in planning, coordinating and operating enterprisewide information systems. SystemView will provide customers with a consistent end-user interface, shared systems management data, enhanced automation, and increased integration among systems management products developed by IBM, software vendors and customers. . . . "

In very real terms, the SystemView strategy provides the IS organization with a framework within which to evaluate and/or develop its systems management applications, whether or not it selects key IBM products.

Furthermore, it places appropriate emphasis on the need for a central information database, an information data map or model, standard systems management applications, and an overall integration of various IS management systems. These provisions serve as the criteria by which IS planning and procurement decisions are evaluated.

The advent of SystemView means that IBM recognizes the need for better products and processes for managing IS. While SystemView can do little to change the existing IS picture within the next few years, it embodies a much needed IS management methodology that organizations can begin to emulate and exploit today. For now, IS managers can take deliberate steps to help improve their management capabilities while preparing their operations for the eventual adoption of SystemView.

To begin, consider responding to SystemView in much the same way as you did to SAA and its initial lack

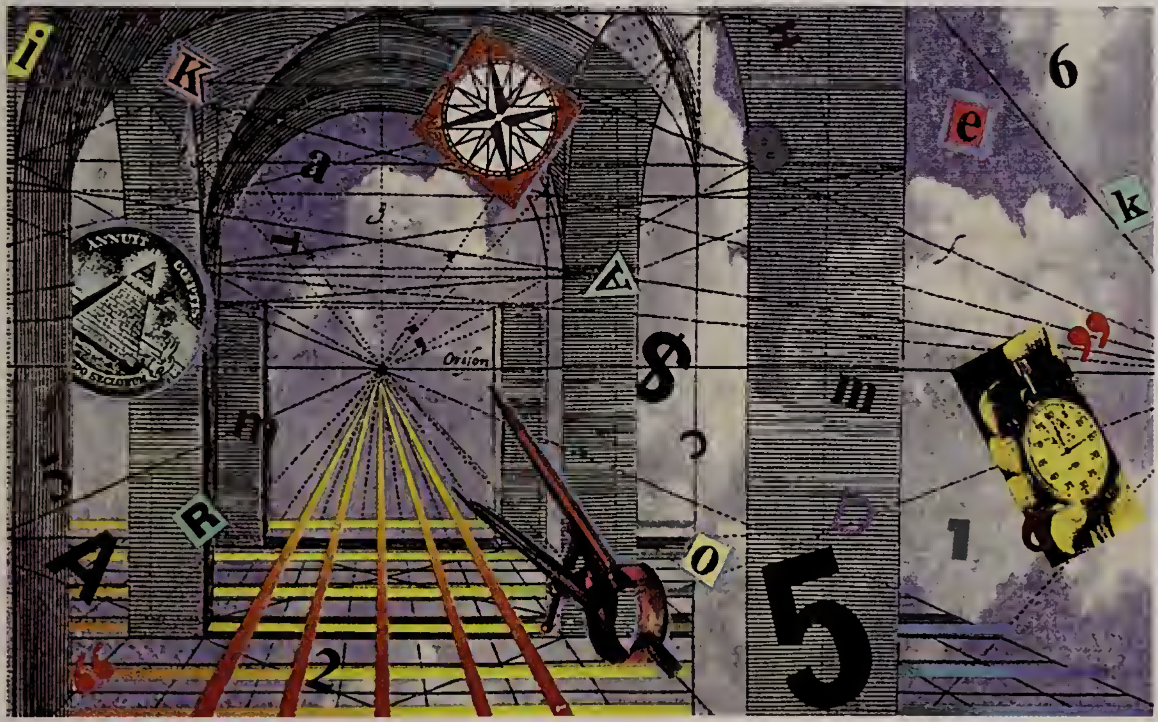

ILLUSTRATION BY ALAN MAZZETTI

of functionality. In other words, you should continue the evolution of your internal systems by acquiring systems and products that are consistent with the new direction.

In a similar fashion, you should act now to ensure that the basis for compliance to SystemView is provided in your own development efforts and by the vendors from whom you purchase IS management solutions.

Companies that have implemented SystemView-related strategies have responded to pressing business demands by establishing effective business practices, not just technical implementations, in key areas. For example, Wholesale Computer Services of Manufacturers Hanover Trust Co. in New York introduced improved business practices for formally marketing and merchandising its IS capabilities, implemented software management practices, achieved high levels of automation of data center operations, and instituted a management reporting system to support formal processes in capacity, performance and financial management for IS. The results are compelling—a 20 percent reduction in operating expenses (from $75 million to $60 million) and a 40 percent reduction in staff (from 400 to 240). Additionally, the organization is forecasting another $20 million to $40 million in projected savings as a result of the actions taken. And last, but certainly not least, estimates reveal a 28 percent efficiency increase in servicing customers.

The Dayton Power & Light Co. in Dayton, Ohio, provides a model case of running IS as a business. Management has taken steps to quantify the key elements of the IS business, establishing a baseline by which to monitor the ongoing operation, compare its effectiveness against that of other companies, and communicate results to its own customer management. In less than two years, the IS organization reduced its headcount by 35 percent and its expenditures by 22 percent. It also improved online availability from 99.5 percent to 99.8 percent while introducing major increases in computing and storage capacity. As a result, IS improved service and capacity for customers while contributing 4 cents to the firm's earnings per share.

There is no question that companies such as Manufacturers Hanover and Dayton Power & Light are substantially ahead of the curve. Both may have to make adjustments in technology to comply with SystemView in the future, but they have completed the most difficult part of their task: putting the processes in place. At the same time, they are dealing with major independent software vendors that will provide the technology migration to comply with SystemView.

How to get started with SystemView will depend on what steps, if any, your organization has already taken to implement a formalized set of business practices and systems. But here are the basics:

> *The advent of SystemView means that IBM recognizes the need for better products and processes for managing IS.*

Recognize the need for formal systems management. Organizations such as Manufacturers Hanover and Dayton Power & Light have imposed effective business practices on their IS groups, and the results speak for themselves.

Save money by spending money. Make sure you commit the necessary funds to explore and ultimately exploit this technology, comparing the expenditure to the anticipated return on your investment.

Define your functional IS management requirements and set priorities. For example, every organization needs a problem/change management process, resource and asset accounting, capacity management, automation, and so forth. Specify each of the functions that you consider to be part of your IS management vision, set functional priorities and develop an implementation schedule.

Make these definitions according to your needs, not product capabilities. By proactively setting forth your requirements, you will be prepared to assess whether vendors' offerings comply with your needs.

Take actions now to reduce costs and streamline your infrastructure. It is better to take this action on your own terms as a well-planned activity. Otherwise, you may find yourself with the unpleasant task of having to make resource and cost reductions in an unrealistic time frame.

Prepare for higher expectations. Corporate management is aware of an announcement of the magnitude of System/390. It will no doubt raise questions about systems management, particularly as systems integrators leverage these issues in selling to your organization.

Plan for the acquisition of required skills. Assess the skills your staff will need to be effective in the environment outlined in SystemView. These critical areas should include:

- MVS/Repository Manager
- Data modeling
- DB2 relational-database technology
- Object-oriented programming
- INFO technology
- NetView
- OS/2 technology
- OSI network management levels

Don't stand still. Act now to provide systems management solutions. There are too many predators stalking the rich opportunities to manage your IS functions, too many CFOs perplexed with IS spending, and too many customers of IS all too willing to consider an alternative.

There's a great opportunity to prosper in today's "do-more-with-less" business environment. The case histories referenced in this article are but two of many. Although SystemView remains only a strategy, it's still a major step in the right direction. CIO

Mario M. Morino is executive vice president of Legent Corp. in Vienna, Va.

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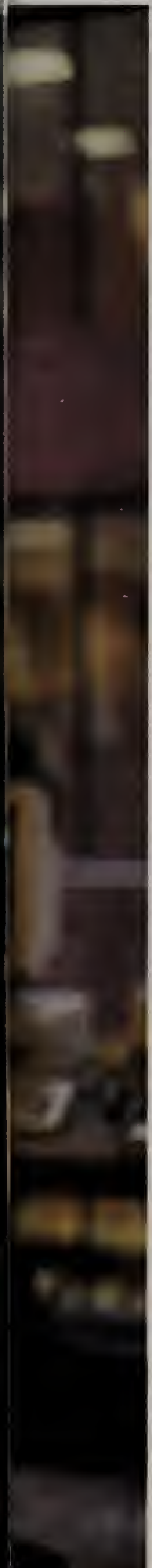
BILL EATON *sees the responsibilities of the CIO expanding to encompass all aspects of "cultural change."*



Levi Strauss's Bill Eaton knows what
the vision thing is really all about

REINVENTING THE CORPORATE CULTURE

BY KATHLEEN MELYMUKA

"We're at a critical crossroads in terms of [the] worldwide competitive environment," said Bill Eaton, senior vice president and CIO at Levi Strauss & Co., the San Francisco apparel maker. "Europe is going to coalesce around an economic base; so are the Americas and the Far East. For me, getting the company ready for that global competitive environment is the critical thing CIOs have to do. It's time for us to make a difference."

When Eaton talks about getting the company ready, he's not just talking about hardware and software, and he's not just talking about business strategy, either. In Eaton's view, the values and ethics of the company are as much the CIO's concern as are the minis and the micros.

"Frontline people will have to make decisions quickly," he explained. "Unless you draw boundaries around the way you want those calls made, you may have calls that don't fit your company.

"My feeling is that the number-one role of the CIO is to be a force and a partner in making companies ready to face the future," he said. "Some CIOs are ready; others take a narrow view: 'Tell me what the business needs are and we'll do the systems to fulfill business requirements.'

"That's not good enough anymore. It's time for us to help set those goals. IT is so intertwined with the

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business plan, it has to be put up front as a shaper of strategy."

According to Eaton, there are four challenges a CIO needs to focus on and work with others to achieve:

- Getting the IT platform ready for the future. This includes systems, architecture—traditional CIO stuff;
- Getting business processes ready to take advantage of the IT platform;
- Getting the organizational structure ready for changes in the way people work;
- Getting people ready for the future—not just IT people but all the people, and not just technically ready but psychically, ethically and emotionally ready.

The CIO has to realize that all these things are interdependent, said Eaton. "Typically we focus on platform, but if we develop the IT platform and then throw it over the wall to users and that doesn't work, we begin to ask why, and we begin to recognize that these things are interdependent. If you put in a $10 million platform but you don't update your processes, and your people are not ready and the organization isn't ready, there will be no improvement (see Human Factors, Page 116).

"We CIOs have to recognize that success in deployment of new technologies means we have got to address all four of the challenges," he said. "Processes have to be re-engineered to take advantage of new technologies. People have to be trained and ready; the organization has to be adapted. It's a much broader role than we're used to thinking about. The CIO role will go away if it's boxed in, but I don't see it going away if its expanded in the way I'm talking about."

Expanding that role has led Eaton to spend what he describes as "huge amounts of time" over the past two years on an endeavor many CIOs would consider out of their bailiwick and some might call a boondoggle:

All This and Technology Too

Backing up Levi Strauss's commitment to human potential is a considerable commitment to information systems as well

THE PRODUCT *development team at work*

While CIO Bill Eaton has been immersed in carrying out the intent of Levi Strauss & Co.'s Aspirations Statement for the past two years, it has not been at the expense of technology. Eaton's broad view of the CIO function assumes that the CIO's own house is in order. "I see a traditional role as well," he said.

Eaton's shop is preparing the company for the technological future by developing systems to support administration, suppliers, retailers and manufacturing.

Levi Advanced Business Systems (LABS) is designed to support day-to-day business activities within and across business functions. Upon completion it will provide online updates and access to operational information for order, product, financial, traffic, administrative and finished-goods management.

LeviLink provides electronic linkages and bar-coding services to support retailers and suppliers. It includes electronic data interchange (for business data) and electronic graphics interchange (for image and data about garments and raw materials). It also relays point-of-sale information to LABS for improved demand forecasting and production-cycle management.

Computer-integrated manufacturing, already operational in some plants, will assist in every aspect of product development—from design to patterning, plotting, cutting and sewing.

The goal of these strategies is for Levi Strauss to evolve into a quick-response manufacturer—that is, a company that is electronically linked to customers and suppliers, applies just-in-time concepts to inventories throughout the logistics chain, and operates with optimized lead times from product concept to product delivery.

Implementation of quick response will require more than technology, Eaton said. There will have to be new relationships with trading partners and internal partners, new assumptions about how business is conducted, better teamwork, the ability to examine and change business processes, and the development of an empowered organization that can operate in an uncertain and sometimes ambiguous environment. The bottom line, Eaton said, is that "we cannot be successful in transforming to a quick-response manufacturer unless we implement the values and behaviors of our Aspirations."

—K. Melymuka

> *“We all want a company that our people are proud of and committed to, where all employees have an opportunity to contribute, learn, grow and advance based on merit, not politics or background.”*
>
> *–The Levi Strauss “Aspirations Statement”*

the development and implementation of an “Aspirations Statement” for Levi Strauss & Co.

“I don’t see this as a project,” said Eaton; “it’s a cultural change. The Executive Management Committee [EMC, of which Eaton is a member] had the notion to think about what we want to be known for when our times are finished here. Were we a group that made a difference or just another management group? They began to feel those notions out, and in 1987-88, the Aspirations Statement was developed. I came into [the EMC] just as it came together.”

Eaton found his way to the EMC after more than a decade at sea, literally. After obtaining a business degree from the University of Washington, he joined the Navy, where he specialized in computer systems. Thirteen years later, he was overseeing logistical systems as a lieutenant commander in the Supply Corps at Navy “corporate headquarters” in Washington. “At that time [1978], minis were going and micros were coming,” he recalled, “but the Navy was moving to bigger systems. I questioned that, and for that and other considerations I left the Navy and came directly to Levi Strauss.”

Eaton joined Levi Strauss in 1978 as MIS manager and, after a number of promotions, became the company’s first CIO in 1988. He also became the first technology chief to sit on the EMC. That committee—made up of the CEO, COO, senior vice president of personnel, president of Levi Strauss International, CFO, corporate counsel, senior vice president of operations and CIO—sets strategy and policy for the company. “The ground rule [of EMC meetings] is that functional hats are left at the door,” Eaton explained.

In that spirit, the group came up with the Aspirations Statement: an attempt to develop a clear, shared vision of what the company should be. “We all want a company that our people are proud of and committed to, where all employees have an opportunity to contribute, learn, grow and advance based on merit, not politics or background,” the statement begins. The one-page text espouses behaviors such as directness, openness, commitment to the success of others, personal accountability and trust. It promotes diversity in the work force, in experience, in perspectives: “Differing points of view will be sought,” it states. “Diversity will be valued and rewarded, not suppressed.”

The statement encourages recognition, “both financial and psychic,” for contributions—“for those who create and innovate and those who continually support. . . .” It calls for ethical behavior; timely, honest communications; and empowerment of employees.

“The motivation was to have a clear, common, shared vision,” said Eaton. “It sounds trite, but the thinking was if we could get people empowered—if we had a common vision of where to go and how to get there—we could move faster and better than before.” Unfortunately, one of the first things the EMC learned was that they couldn’t move as fast as they had hoped. “After we finished the statement, we finally came back and said, ‘Here’s how we want the company to be.’ And everybody said, ‘That’s fine.’ And nothing changed. So by mid ’89 we knew it would take more than words on paper. We needed to get people to struggle with it as we had.”

FOUNDING FATHER *Levi Strauss*

PHOTOS COURTESY LEVI STRAUSS & CO.

The EMC devised several strategies to get employees to think about what the statement really meant. “Leadership Weeks” were developed with help from Tom Peters’ consulting group. Begun in 1989, there have been about 35 such events to date. Each session takes cross-functional groups of about 20 managers off-site to “struggle with values, what people stand for, what they want to be known for,” said Eaton.

They also take part in exercises designed to demonstrate how faulty assumptions and the lack of a common vision doom team projects to failure, while openness and a shared view of what success looks like lead to achievement.

Another important product of the sessions, Eaton said, is the realization that people are often paralyzed by their own assumptions. “Typically there’s a lot of energy around how some people don’t believe this will work,” he explained. “Later in the week, they see that they reflected a lack of their own empowerment to deal with problems. They assumed they couldn’t do something because they had never tried. They had a victim mentality.” The Leadership

Week sessions help people to "realize they can make things happen."

The company also holds three-day "Diversity Workshops" designed to get people to learn about diversity and to value it. Employees look at "how each got to be where he or she is and how the rest of the world got to be where it is," said Eaton. They explore the way they see themselves and the way they think others see them, as well as their perceptions of other individuals and groups. The workshops aim to raise awareness of how people mistakenly categorize themselves and others.

A third strategy—ethics workshops—is currently being developed, and Eaton is working with Senior Vice President for Personnel Donna Goya to develop the next phase of the effort, which will target those on lower rungs of the corporate ladder. Eventually, said Goya, "there will be training for everybody from the mailroom [staff] to the operators in the plants."

Can all this preoccupation with humanity stand up to the cold, cruel, business world beyond San Francisco Bay? Definitely, Eaton insisted.

"We're not all sitting around practicing EST," he said. "[The] Aspirations [approach is] very much a part of getting people and the organization ready for the future. [It] directly attacks the people side and the organizational side" of the CIO's four challenges.

Take the Diversity Workshops. "It's a global economy," said Eaton. "It's a diverse world. Which companies will provide goods and services for that diverse world and use diversity to advantage?"

The Leadership Weeks are pertinent too. "If you give people the systems and information they need to make quick, high-quality decisions, but they approach a decision with a victim mentality, they can't make the decision," he said. "They think the boss has to do it. What good is that?"

> *"We didn't appreciate how hard it would be and how long it would take. It's a large-scale cultural change, and that takes years. It has to cascade down through the organization."*
>
> *–Bill Eaton*

Measuring progress toward living up to Aspirations is difficult, but in the next few months, employee attitudes about the corporate culture will be surveyed and compared with baseline data gathered about 18 months ago. Meanwhile, Eaton said, some things clearly have changed. For example, many management teams now appraise their bosses' performance rather than the other way around.

"My management team rates me against the Aspirations Statement," Eaton explained. "The difference is, are you upward-serving—serving your boss—or do you want your organization to be empowered? You should be nurturing, coaching, making sure they have what they need to achieve agreed objectives."

Which is not to say that the boss doesn't appreciate Eaton's efforts, too. "[Eaton] gets the highest ranking of people who report to me for how he deals with his people," said President and COO Tom Tusher. "He manages better than anyone here in terms of the technical requirements of his job and the people-management aspects. Either you have that kind of balance or you don't. Bill just happens to have it. It's just another example of how effectively he puts technology and Aspirations together. It's very visible to people who work for him and to those outside. He's a terrific visionary."

When Eaton looks ahead, he sees a long and rocky road. "We didn't appreciate how hard it would be and how long it would take," he admitted. "It's a large-scale cultural change, and that takes years. It has to cascade down through the organization.

"But there's a lot of commitment to it," Eaton stressed. "We've proven [that Aspirations] is alive, viable and sustainable rather than a management-of-the month project. The big question is, when a down business cycle hits, will we see it through? We recognize that's one of the tests still out there in front of us.

"We're not finished yet," he said, "but we're on the journey. We probably always will be. But some companies aren't on the journey yet, and some don't even know there's a journey to be taken." CIO

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Kathleen Melymuka is a freelance writer based in Duxbury, Mass.

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Forget multiyear time frames.
Welcome to the decade of the turbocharged systems-integration project.

SYSTEMS INTEGRATORS, START YOUR ENGINES...

BY DAVID FREEDMAN

HOW LONG SHOULD IT take an organization to plan, design and start delivering results from a strategic systems-integration project? A year-and-a-half? Two years? Four? If these time frames seem reasonable, then prepare to eat your competition's dust—if your own user community doesn't lynch you first.

The days of taking requests for systems and then disappearing for years at a time will soon be gone forever. Business units want payoffs in months, and a growing number of organizations are learning how to deliver. As George Hathaway, a principal at the Index Group Inc. in Cambridge, Mass., put it, "It's like *Top Gun* now; you've got to feel the need for speed."

Though it's a relatively recent phenomenon, the new emphasis on fast turnaround has achieved a firm foothold in the systems-integration industry. "Most of our projects are now what I'd call short time-frame," said John Oltman, worldwide managing partner for integration services for Chicago-based Andersen Consulting. "If it takes three years to complete a project, then by the time you're finished you'll have spent a lot of money and all the business requirements will have changed."

This accelerating pace of change in the business world has worried CIOs for years. Now the problem seems to have reached emergency proportions. "It's become extremely critical to be able to apply technology rapidly in response to business situations

WILLIAM CHENEVICH *(above): the "SWAT team" approach;* **MICHAEL SURH** *(right): The real payoff is user satisfaction.*

PHOTO LEFT BY LOIS GERVAIS; PHOTO RIGHT BY KENT HANSON

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that arise," said Hal Todd, executive vice president of National City Corp., a Cleveland-based bank that has undertaken a major high-speed systems-integration project. "The extent to which we're successful in doing this will largely determine our ability to achieve a competitive edge."

Of course, all the motivation in the world won't make quick-turnaround projects a reality if the organization lacks the resources to achieve them. But CIOs are finding that the capability is there; it just requires a radically new way of looking at things—and a willingness to, well, cheat.

MARSHALL BALTER: *business urgency*

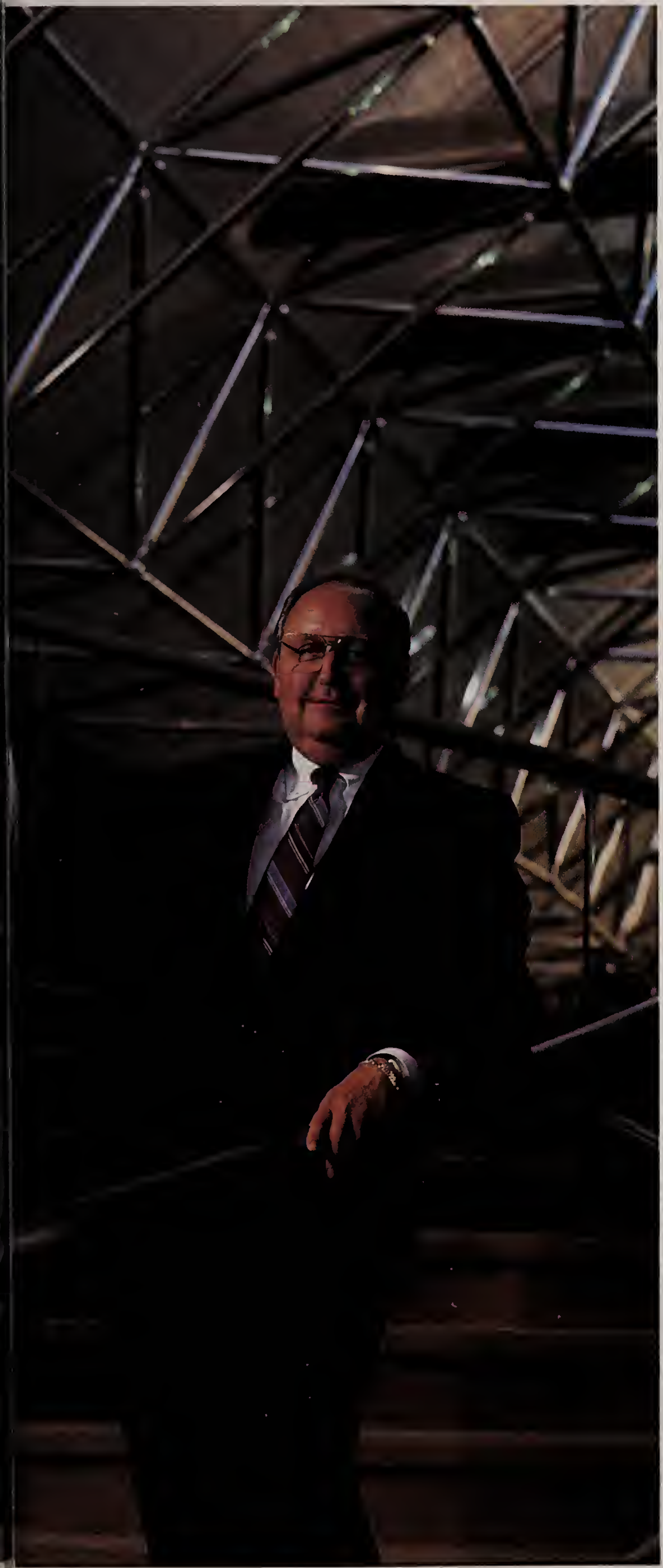
"We attempted to build the new systems we needed with traditional mainframe-type development approaches, and it wasn't working," said William Chenevich, president and chief operating officer of Security Pacific Automation Co. in Los Angeles, which serves as the information technology wing of banking giant Security Pacific Corp. Instead of throwing dozens of programmers at the task of rebuilding major systems from scratch, said Chenevich, SPAC now takes what he calls a "SWAT team" approach: Small groups of developers rely on high-speed prototyping techniques to churn out applications that sit on top of and access information in existing core systems. "With the cost of hardware and storage going down, it's quicker and cheaper to put in layers and layers of applications," he contended. "Sooner or later the entire thing has to be re-engineered, but we can worry about that later."

The idea of layering—in effect, "hiding"—existing core systems beneath fast-prototyped applications has emerged as the cornerstone of high-speed systems integration. "Companies often say their core systems are unworkable and decide to throw them out and start over, which takes years," noted Kenneth Sloan, a senior consultant for third-party integrator Perot Systems Corp. in Dallas. "But what they're really facing is a symptom, which is that they can't get the right information into or out of the core system. We often find that the core systems aren't fundamentally unsound; it's just a matter of redefining the problem as being one of consolidating and getting data [into] and out of these systems in new, more useful ways."

Like many other high-speed integrators, Perot Systems uses small teams of a half-dozen or so information technology specialists. These teams work with users from the client's business units to quickly throw together prototypes of the interfaces needed for the new applications. The interfaces are assembled on the fly with screen-generating tools that access data files simulating those of the core application. This technique eliminates the time-honored—and time-consuming—process of developing user requirements before the project starts. "Getting users to sign off on paper specs is a joke, a completely useless exercise in futility," snorted Sloan. "Our main focus is to not bother the user with anything that is distinguishable from the real thing."

To the users, the finished applications look like entirely new systems, but in fact they are pseudo-applications that add a pretty face and new functionality to old core systems. In one project Perot Systems recently completed for a bank, an existing customer-service system that required representatives to plow through 20 screens of forms is now hidden behind a single-screen interface that digitizes written customer-service requests. Building a completely new system would have taken as much as three years, said Sloan; this project required five months

PHOTO BY KENT HANSON



KENNETH SLOAN *(above): redefining the problem;* **CHARLES NORTON** *(near left): "You've got to be able to deliver in well-defined short steps."*

from start to finish. "In many cases, we can build applications like this in less time than it would take just to roll out a completely rebuilt core system," he boasted.

IF THERE ARE STILL DOUBTS that this approach to systems integration is the wave of the immediate future, they could probably be dispelled by the fact that IBM itself—the king of the long-time-frame, high-priced systems-development project—now talks up the high-speed concept with the religious fervor of the newly converted. "If you can't get a project done in a couple of months, then you won't be able to get a strategic advantage from it," said Marshall Balter, the director of IBM's Enterprise Alliance program.

The Enterprise Alliance program is IBM's commercialized version of the layering approach. For $75,000, IBM sends a small team of specialists to the client to throw together a highly functional prototype of a desired system within 30 days. The client can then hire the specialists on for a few more months to develop a production version of the system, or it can finish the project with its own people. "One of our main objectives is to transfer skills and technology to the customer so they can do it on their own," said Balter.

PHOTO CENTER BY JOHN GILROY, PHOTO RIGHT BY KEITH WOOD

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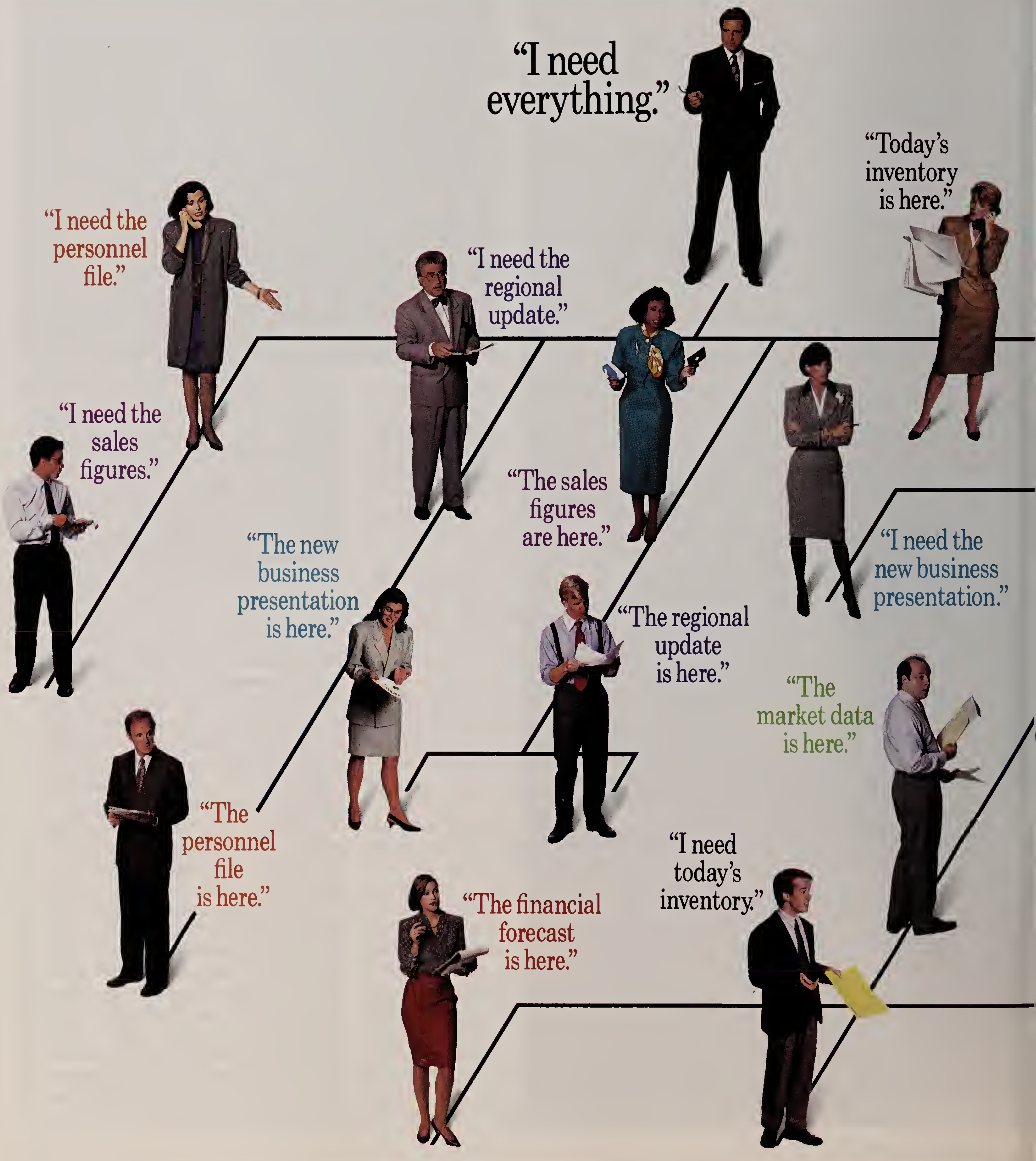
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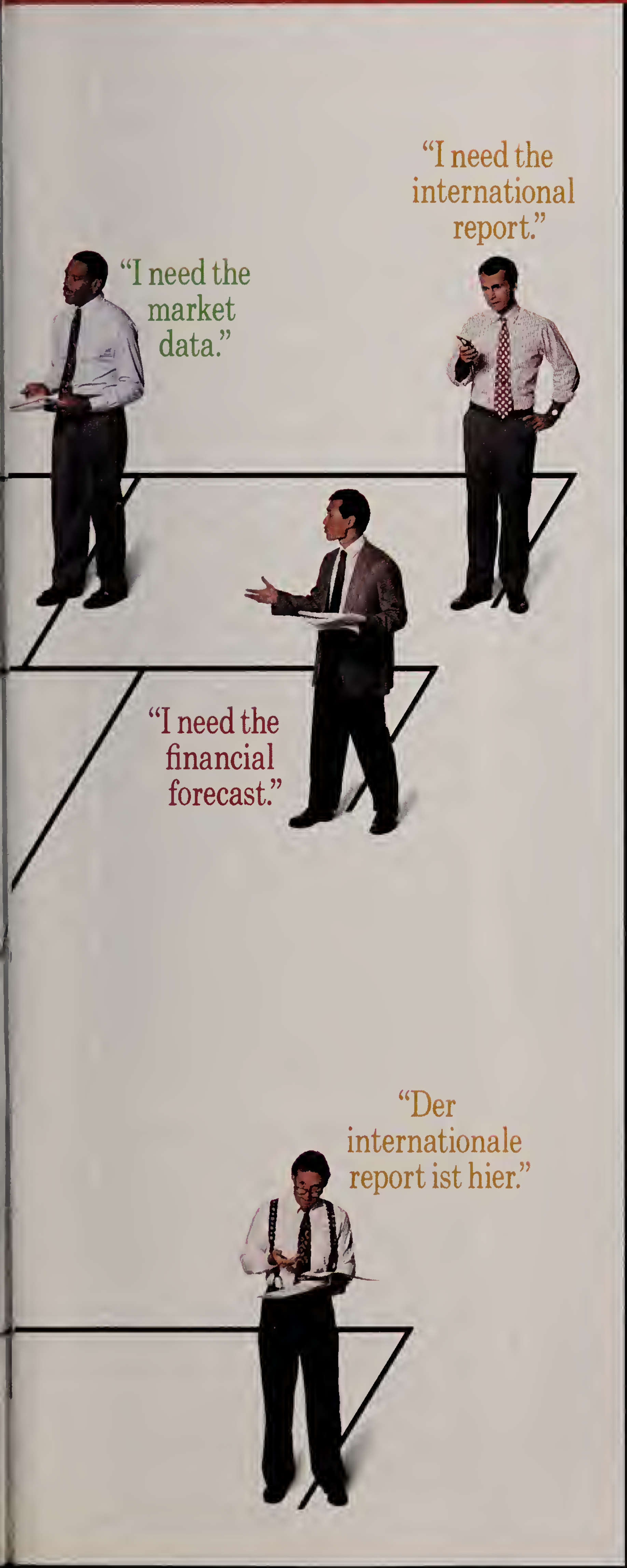
"I need the regional update."
"I need the sales figures."
"The sales figures are here."
"The new business presentation is here."
"I need the new business presentation."
"The regional update is here."
"The market data is here."
"The personnel file is here."
"I need today's inventory."
"The financial forecast is here."

happen.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The Racing Team

An in-house development lab is applying quick-turnaround techniques to get systems out of the pits in one-third the time

Textron Lycoming, a Stratford, Conn.-based manufacturer of jet-airplane and tank engines, was so impressed with the layering approach to systems integration that it learned from its consultant, the Cambridge, Mass.-based Cambridge Technology Group, that the company has established an in-house unit to concentrate on quick-turnaround projects.

Among the several applications that Textron Lycoming's Strategic Computing Laboratory has turned out in the past four years is one that tracks the reliability and repair records of the M1 tank engines manufactured by the company, engines that are installed in thousands of tanks throughout Europe and the rest of the world. Before the system was developed, almost any non-trivial tank engine malfunction required removing the engine and sending it to a regional repair depot. Now the new system helps diagnose the likely causes of any malfunctions, often allowing repair of the engines in the field.

MICHAEL SURH *gives users what they want by building systems "on the fly."*

PHOTO BY KENT HANSON

Another application from the lab monitors inventory levels of jet engine parts, alerting the company to possible excess inventory due to changes in engine design or in purchase orders. Both of these applications, like most of those that come out of the lab, were created by linking together existing systems and then building on top of them.

According to Textron Lycoming IS Director Michael Surh, it usually takes the lab about five days to build a working prototype, and then about six months to add the documentation, security and additional functionality required for a production system. That's about one-third the time taken up by the company's traditional systems development approaches. Surprisingly, Surh claims that the quick turnaround time isn't the biggest benefit of the lab's approach; the real payoff comes from giving the users exactly what they want. "When you put your requirements down on paper and then you see the system six months later, you've forgotten all about what you wanted then," he explained. "But when you build something on the fly, you think up the requirements and 10 minutes later you see them on the screen. The whole process of requirement definition and validation is compressed into one week. It took 50 years to flesh out the requirements for what started off as the horseless carriage; suppose that could have been done in one week?" —*D. Freedman*

Balter insists that the high-speed approach is the only way to go these days. "It takes a lot of risk out of the agenda," he said. "Most companies look at five-year and $30 million plans, and they don't see any results for a year-and-a-half. But this way, you can bite off a strategic chunk, fly it before you buy it, and get meaningful business results right away."

The program also helps IBM's beleaguered CIO customers respond to a question that is put to them with frightening regularity by CEOs: "Where's the payoff from all the millions we've already spent on information technology?" Explained Balter: "This allows CIOs to tell other executives, 'You know that investment you're always wondering about? Well, we're building on top of it, so it was worth it.' "

Though IBM's weight is giving the concept of quick-turnaround systems integration sudden visibility, the idea has actually been around for several years. One of the first organizations to formalize the layering approach was a small consulting company called the Cambridge Technology Group, in Cambridge, Mass. Textron Lycoming, a Stratford, Conn., manufacturer of jet-airplane and tank engines, was an early convert to the Cambridge approach. After working on a prototype with the consultancy, Textron Lycoming went on to set up what Information Systems Director Michael Surh termed the Strategic Computing Laboratory (see related story). "Our philosophy is to concentrate our efforts on those applications that we feel have a potentially strategic impact, especially those oriented to our customers," he explained.

ENTHUSIASM FOR THE SPEEDY approach runs high. The Index Group's Hathaway goes as far as insisting that companies shouldn't tackle any IT project, no matter how complex, that can't be developed through the high-speed method. If the project is just too large, he contends, then it should be broken up into three-month chunks that lend themselves to the process. "If you try to deliver an entire solution in 12 months, then 80 percent of the original requirements will have changed by the time you're finished," he said. "The requirements don't change that much in three months. Then once you put it in users' hands, they can tell you how the requirements are changing and you can deliver those new requirements three months later. That way the system can evolve along with user needs."

One company that put that theory to the test was Westinghouse Furniture Systems, a business unit of Westinghouse Electric Corp. The Grand Rapids, Mich., vendor of office furniture started to feel competitive heat two years ago when other furniture vendors began whittling away at the lead time between receiving orders and delivering furniture.

"First it was cut from 30 days to 20 days, and now it's heading for 10 days," said Charles Norton, the company's manager of management systems and services. "Meanwhile, we were bringing out new products, our business was growing, and everything was changing around us." The key to coping with this storm of change, said Norton, was the company's order-entry system, which also drove the manufacturing and delivery systems. Unfortunately, the system wasn't flexible enough to keep up with the pace of change, and Norton decided it had to be replaced—fast.

The system needed more than a face-lift, but replacing it would take 18 months, and Norton knew the business was changing too quickly for that sort of turnaround time. So he broke the project into three-month chunks. "Each time we brought out a piece, we got to see how the users liked it; and what they didn't like we were able to change in the next piece," he said. "There's no way you can keep people on your side if you're talking about years of effort. You've got to be able to deliver in well-defined short steps."

Employing fast turnaround methods not only more closely meets user requirements; according to some, it can actually result in entirely new ideas for applying technology to the business. "This whole approach takes the constraints off," said IBM's Balter. "It allows you to cross systems borders and alter your original ideas, and you end up with something that's even better than you imagined."

As an example, Balter noted that his group was called in by an insurance company to tighten up some administrative systems. After playing around with the prototyping process, however, the users were soon envisioning a system that would allow service reps to summon up a customer profile onto the screen, complete with recommendations about which products might be pitched to the customer on the spot. "When you broaden your thinking this way, you can create amazing change for the company," gushed Balter. "This isn't about technology, it's about business urgency."

DOES ALL THIS SOUND TOO good to be true? Many CIOs are sure that it is. "Some very enlightened CIOs see what we can do and say, 'Let's get going,' " noted Balter. "Others prefer to, well, ruminate. There's a natural resistance because it's a different mind-set." In many cases, said Perot Systems' Sloan, CIOs hesitate to support the new approach because they've seen so many other efforts fail. "Traditional MIS organizations are scared and skeptical," he said. "They often prefer to stand to the side and watch you fail. They don't want to risk their careers on solving the problem."

DALE TERRELL *built the new capabilities on top of the bank's existing systems.*

PHOTO BY LOIS GERVAIS

But some CIOs see it differently. In their view, they simply have no choice in the matter; the system has got to be built more quickly than can be done by traditional means, or everyone is going to be job-hunting.

Dale Terrell, executive vice president of information systems for SPAC, found himself facing that sort of situation a few years back when Security Pacific's competitors started to introduce around-the-clock bank-by-phone systems. Such systems are challenging enough to develop, given the need to process large volumes of

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yesterday. A museum of
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impending doom closed
burst into the small
large metal switching
And I said in a voice
turn into a Nehru
then, above the hiss of
"Relax. You bought an
you expand, up to 90%
Investment protection . . .
be yours." And as I drove
I felt good because life, after

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waving good-bye.... I cleaned the garage
obsolescence. Go-go boots and lava lamps.
settled around my ankles, this feeling of
in on me like night. So I rushed to work,
room most people avoid and stared at this
device sitting there Buddha-like in the dark.
soft as a prayer, "Don't get old on me. Don't
jacket. Grow. Expand. 30,000 lines." And
the air conditioner, I heard this voice say,
AT&T DEFINITY® System. I'm modular. As
of my hardware can stay the same.
ISDN...virtually limitless growth. It can all
the Rambler home, the 8-track boomed and
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many different types of transactions in real time. But Security Pacific faced a particularly difficult task, since it was in the process of acquiring some seven major banks in a number of states and had to deal with information scattered across more than 1,000 branches and dozens of different banking systems.

The company had already undertaken what will be the ultimate solution to its IT problems: a five-year, $50 million project to rebuild all its systems. But SPAC couldn't wait that long for a centralized customer-service system. "If we had had to wait even three years for the system, it would have put us severely in the hole competitively," said Terrell. To get faster results, Terrell got six of his people together with a hardware and a software vendor, and told the group to build the necessary system capabilities on top of the bank's existing systems. Within six months the bank had rolled out the initial version of the system, complete with a touch-tone interface providing automated home-banking. The system now allows customers to perform over 100 different types of transactions without human assistance at a rate of over 150,000 calls a day. In addition to heading off a competitive routing, the system has also cut the cost of providing customer service by 15 percent, said Terrell.

High-speed systems integration isn't a panacea for all information technology ills. Like Security Pacific, many organizations realize that sooner or later they must completely rebuild their core systems, at great cost and within long time frames. "We have multivendor chaos out there right now," said Peter Keen, executive director of the Washington-based International Center for Information Technologies. "A lot of electronic mess is going to have to be cleaned up, and in many cases it will take an investment of up to seven years to build an information systems platform that can serve as the lifeblood of the organization."

Leading Systems Integrators, By 1989 Revenues

COMPANY	LOCATION	REVENUES*
Electronic Data Systems Corp. (EDS)	Dallas	$1,647
Andersen Consulting	Chicago	1,645
IBM Corp.	Armonk, N.Y.	1,238
Digital Equipment Corp.	Maynard, Mass.	715**
Unisys Corp.	Blue Bell, Pa.	523
Computer Sciences Corp.	El Segundo, Calif.	510
Boeing Computer Services	Seattle	360
SAIC	San Diego	261
Martin Marietta Data Systems	Bethesda, Md.	210
McDonnell Douglas Systems Integration Co.	St. Louis, Mo.	209
Grumman Data Systems	Bethpage, N.Y.	181
The Black & Decker Corp.	Towson, Md.	155
Systemhouse Inc.	Arlington, Va.	120
TRW Information Networks	Torrance, Calif.	118
KPMG Peat Marwick Main & Co.	New York	115
AT&T	New York	110
American Management Systems Inc.	Arlington, Va.	100
Logicon Inc.	Torrance, Calif.	96
Deloitte & Touche	New York	80
Price Waterhouse & Co.	New York	79
Control Data Corp.	Minneapolis	72
Ernst & Young Inc.	New York	60
Computer Task Group Inc.	Buffalo, N.Y.	50
Coopers & Lybrand	New York	45
CACI International Inc.	Fairfax, Va.	28

**In millions **Best available estimate at press time*

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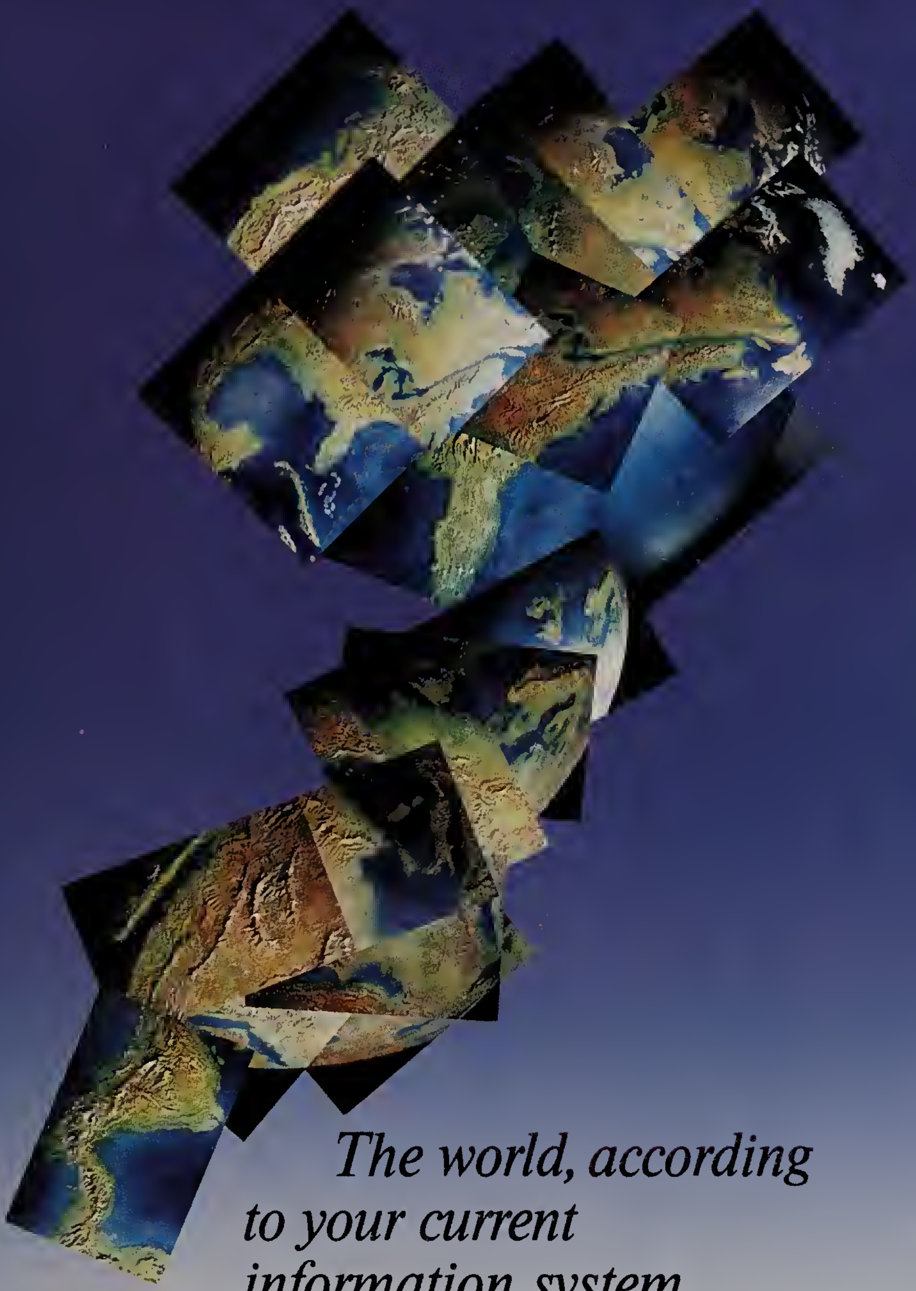
> *"Most companies look at five-year and $30 million plans, and they don't see any results for a year-and-a-half. But this way, you can bite off a strategic chunk, fly it before you buy it, and get meaningful business results right away."*
>
> *–Marshall Balter*

Be that as it may, the high-speed approach to systems integration means that organizations don't have to wait around watching competitors eat their lunch while the platform is being built. And who knows? Maybe it won't be long before somebody figures out a way to build an entirely new platform from scratch in just three months. CIO

David Freedman is a freelance writer based in Brookline, Mass.



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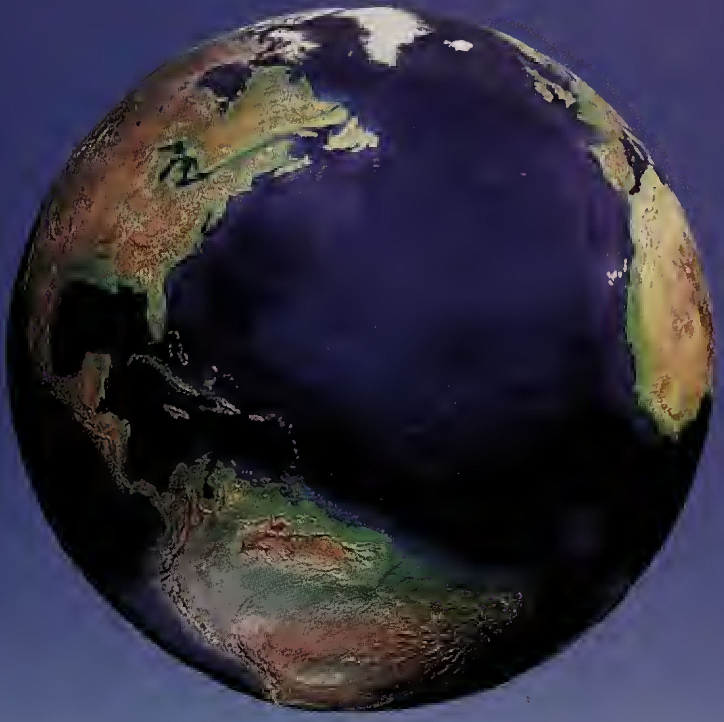

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THE WHIPLASH EFFECT

CIO turnover can produce some painful organizational symptoms that spread through the IS group, and beyond

BY ALLAN E. ALTER

Until now, most of the ink spent on the subject of CIO turnover has considered its effect on the careers of departed CIOs (see "A New Twist on Turnover," *CIO,* October 1990). But any changes at the IS summit can sweep down through the organization with potentially disruptive results.

One of these consequences caught Richard Koeller by surprise during a pulse-taking mission. "I talked to my back-shift people in the computer room over breakfast one morning, after being here a year," said Koeller, vice president of information technology at Whirlpool Corp., in Benton Harbor, Mich. "I could sense their concern about the future. I talked to them for about half an hour to convey my seriousness about this job and my commitment to Whirlpool. I went on and on, and I saw it wasn't doing any good."

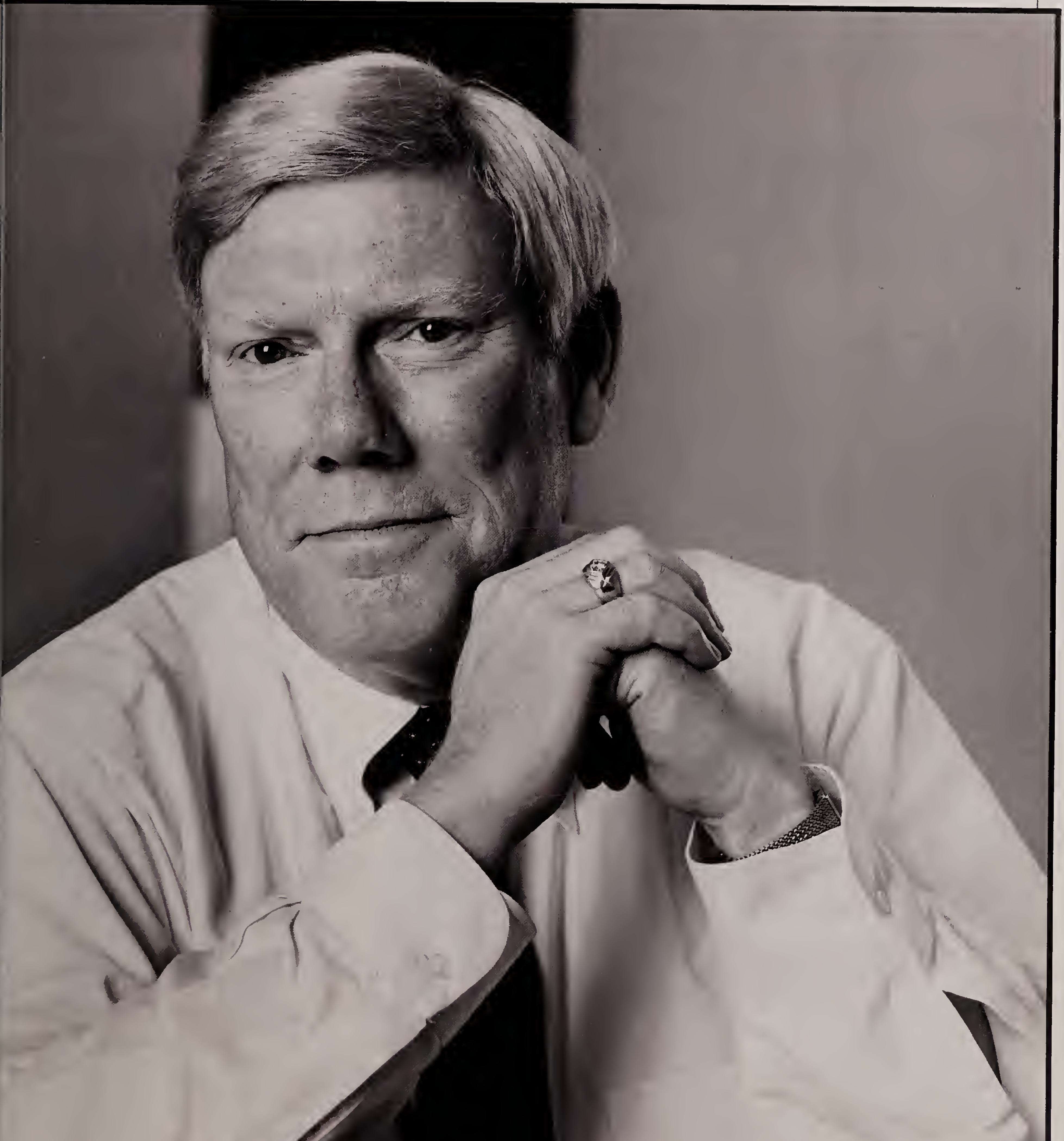
The problem, Koeller discovered, was his own credibility. He had devised ambitious plans, but his staff lacked confidence that he would remain long enough to see his plans through. "I asked how long do I have to be here [to prove my commitment]—seven years? And they said 'yes.' "

CIO turnover impacts both the CIO and the IS organization itself. The situation will differ in every company, depending on the personalities involved and the circumstances under which the former CIO left. And some CIOs who have changed jobs, such as the Bank of Boston's Michael Simmons, have not found their own job-hopping to be an issue with their staffs.

RICHARD KOELLER *(above) has to prove his commitment to his staff;* **WILLIAM HARRIS** *(right) sees staffers worried about job security and career growth.*

But other CIOs, former CIOs and lower-ranking IS professionals agree that the reactions of IS managers and staff to CIO turnover can put a new CIO's agenda at risk.

PHOTO RIGHT BY KENT HANSON; PHOTO LEFT BY DAVID WAGENAAR



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GARY RIETZ: *Speculation about a CIO's likely tenure is a waste of time.*

PHOTO BY DAVID WAGENAAR

Whenever the CIO post changes hands, the IS organization is affected. But when the IS staff also doubts whether the new CIO will remain, the potential for trouble is great. "Tremendous trauma can take place," and resistance to the new CIO is likely to occur, particularly when the company has changed CIOs frequently, said William N. Harris, a former IS executive who is chairman of Behnke Harris & Associates, a New York IS consulting firm that assesses IS credibility in companies. According to Harris, it is common for IS people to say to themselves, " 'Why should I stick my neck out and do anything out of the ordinary for this new guy, when his predecessors have only been here 18 months apiece? If I'm a survivor, I'll still be here when the third CIO after this guy comes on board.' "

To illustrate the sorts of things that can befall an IS group that grows accustomed to frequent changes at the top, consider the grim observations of an upper-level IS manager who asked not to be identified. His company is a well-established and highly profitable East Coast consumer-products company. Nevertheless, frequent CIO turnover has left IS

It is common for IS people to say to themselves, " 'Why should I stick my neck out for this new guy, when his predecessors have only been here 18 months apiece? I'll still be here when the third CIO after this guy comes on board.' "

–William N. Harris

badly fragmented and nearly incapable of change, he said. And he has witnessed the same pattern at previous employers.

In his company's climate of IS instability, the manager said, a new CIO can run into opposition at any level of the IS organization.

"The worker bees—programmers, analysts and designers—tend to have their own mutually supportive technical culture," he explained. "They tend to be work-driven and more focused on their technologies and methodologies; they intentionally maintain a low profile. While they may have a tremendous amount of interest in what's going on, it's at the gossip level." Their attitude toward their new CIOs is somewhere "between skeptical and arrogant. Their notion is, if you don't like the current CIO, wait a couple of years." The result is "foot-dragging" in implementing the new CIO's agenda.

Further up the line, according to this IS veteran, the lower-level IS managers tend to forge expedient alliances with the users, going out of their way to support perceived user needs. This gives these managers a sense of security—"Keep your user happy, and you can probably keep out of trouble," he said. But it also leads to a parochial view of the world in which IS managers become advocates of the status quo. Meanwhile, the CIO, who has a corporatewide agenda, is encouraging change, which "places a conflicting demand" on the lower-level managers.

Because changes at the top have become so entrenched a part of the culture, the IS managers tend to honor their more durable loyalties to users, apprehensive—like the worker bees—that the regime will change before the CIO's agenda can be implemented. "These managers may not ignore directives from the top, but they will try to delay them," said the IS veteran. "They may try to water them down and even get their user communities to raise doubts

'Excuse Our Appearance While We Remodel'

Changes in the IS shop can confuse its steady customers

When there is change at the top of the IS organization, the departments and managers served by IS are affected too. Their response to CIO turnover can make a big difference when new CIOs implement their agenda. Reactions vary from hopefulness to frustration to clinging to the status quo.

It's hard for non-IT people to understand what's happening in the IT world, said Richard Koeller, vice president of information technology at Whirlpool Corp. in Benton Harbor, Mich. "Dramatic changes in IS strategies and approaches just radically confuse the [internal] client base. If IS spends two years trying to get the client base to understand what a distributed-processing strategy means and the new CIO comes in and centralizes things, all those clients throw up their hands and say, 'I give up. You guys don't know what you are doing.' "

Line managers may read the turmoil at the CIO level as justification for ignoring and undermining major new IS strategies, said a high-level IS manager with an East Coast consumer products company who spoke on the condition that he not be identified. Their interest is in making sure their work gets done, not in pursuing the CIO's corporatewide good. That inclines the line manager to support the status quo, and to coopt the IS manager who serves the line function to put parochial needs first.

End-user managers can feel frustrated by CIO turnover, but they may also respond with hope and optimism, said William N. Harris, chairman of Behnke Harris & Associates, a New York consulting firm. "You sometimes see a user executive who says, 'The other people weren't willing to listen to me, but maybe the new guy or gal will.' So they actively pursue the new CIO and try to build partnerships. If the new CIO is smart, they will pick this up and build those partnerships."

But Harris has one caveat to this positive scenario: Hopes of building good relations with other executives will almost certainly sour if the CEO is using the new CIO as a point man for changing the corporate culture without telling either the CIO or the other executives. If the change efforts fail, the CIO will take the fall for the CEO.

—A.E. Alter

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about the value of the [CIO's] plan."

Above the IS managers are IS directors. Their burden includes translating the new CIO's strategy to their subordinates, and perhaps also carrying the plan beyond IS and into the user community. They have only two options, the IS veteran said: to throw in their lot with their first-line IS managers or with the new CIO.

The first option "assures them of peace in their organizations, at the expense of the CIO's game plan." If the directors are lucky, they will outlive the CIO; but if they're not, the CIO may realize that they're not supporting the agenda, and get rid of them. If they cast their lot with the CIO, their tenure is unlikely to exceed the CIO's by much.

> *Whenever there is a change at the CIO level, "there's a feeling of uncertainty in the IS organization. Longtime company employees are bound to be apprehensive."*
>
> *–Thomas Gaughan*

Either way, it's a sorry situation for the directors. "They suffer a tremendous amount of frustration. They are torn to the point where their effectiveness is severely affected."

According to the IS veteran, it's also trouble for the IS organization as a whole, dampening change as well as individuals' initiative and aspirations. "Managers do not want to become a director, ever," he said. "Promotability is a three-year window to hell." Consequently, a tremendous gulf is created between the CIO and his directors, managers and workers. "That's probably the most damnable result of CIO turnover."

THOMAS GAUGHAN: *Change at the top is always unsettling.*

On the Other Hand . . .

It's an ill wind indeed that blows no good

For some in IS, CIO turnover can have its positive side. A new CIO can mean new life for stalled careers, according to Ron Brzezinski, a Coopers & Lybrand consultant in New York. "There are sometimes tremendous new opportunities when a new IS executive comes in."

According to Brzezinski, "The new person tends to look at skills and personalities by what they are today. They are not tainted by past baggage and biases." The new CIO is thus able to reposition people in more appropriate jobs and "breathe a new sense of life into everybody." For example, when Brzezinski became CIO of The Quaker Oats Co. of Chicago, he moved Gary P. Rietz out of systems development and made him the liaison between IS and the client groups. "It was really a good opportunity at the time," said Rietz, "because it gave me exposure to a lot of the management of the company."

Sometimes the IS staff sees that a change at the top is needed to revitalize the function. "You read . . . about systems coming closer to business," said Rietz. "Well, that wasn't happening at Quaker. When Brzezinski brought systems out of the back room, [that was] an unbelievable opportunity. Change was necessary."

And when Brzezinski left? "Change wasn't all that important [anymore]," Rietz said. "The time was right for a solid manager, [and] the company found a very proven, solid, operations-type guy." —*A.E. Alter*

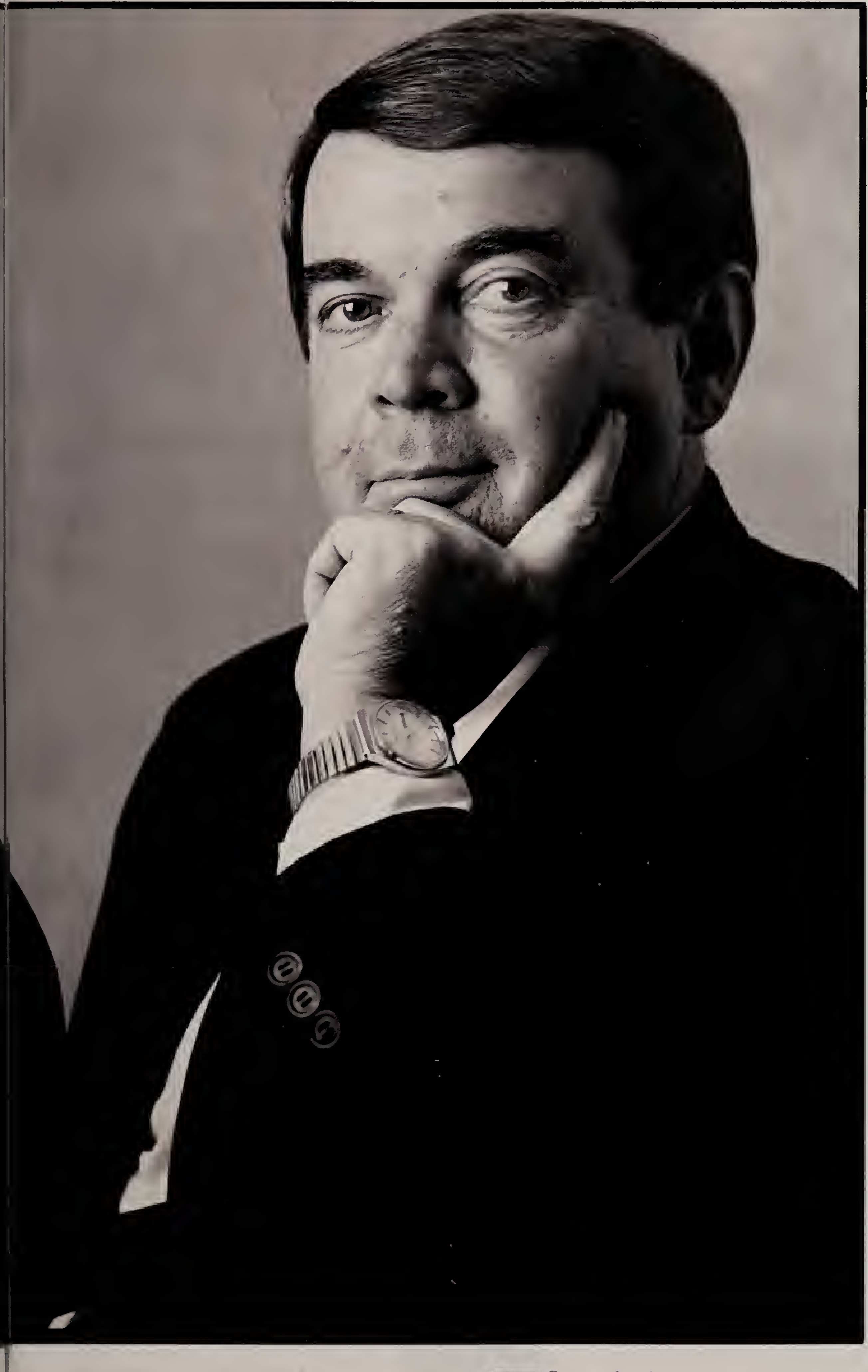


PHOTO BY KENT HANSON

In addition, he said, job security within the IS group ends up being controlled by the users. The net result of this situation is that "DP doesn't get better; it gets more fragmented," which "clearly inhibits any kind of global strategy."

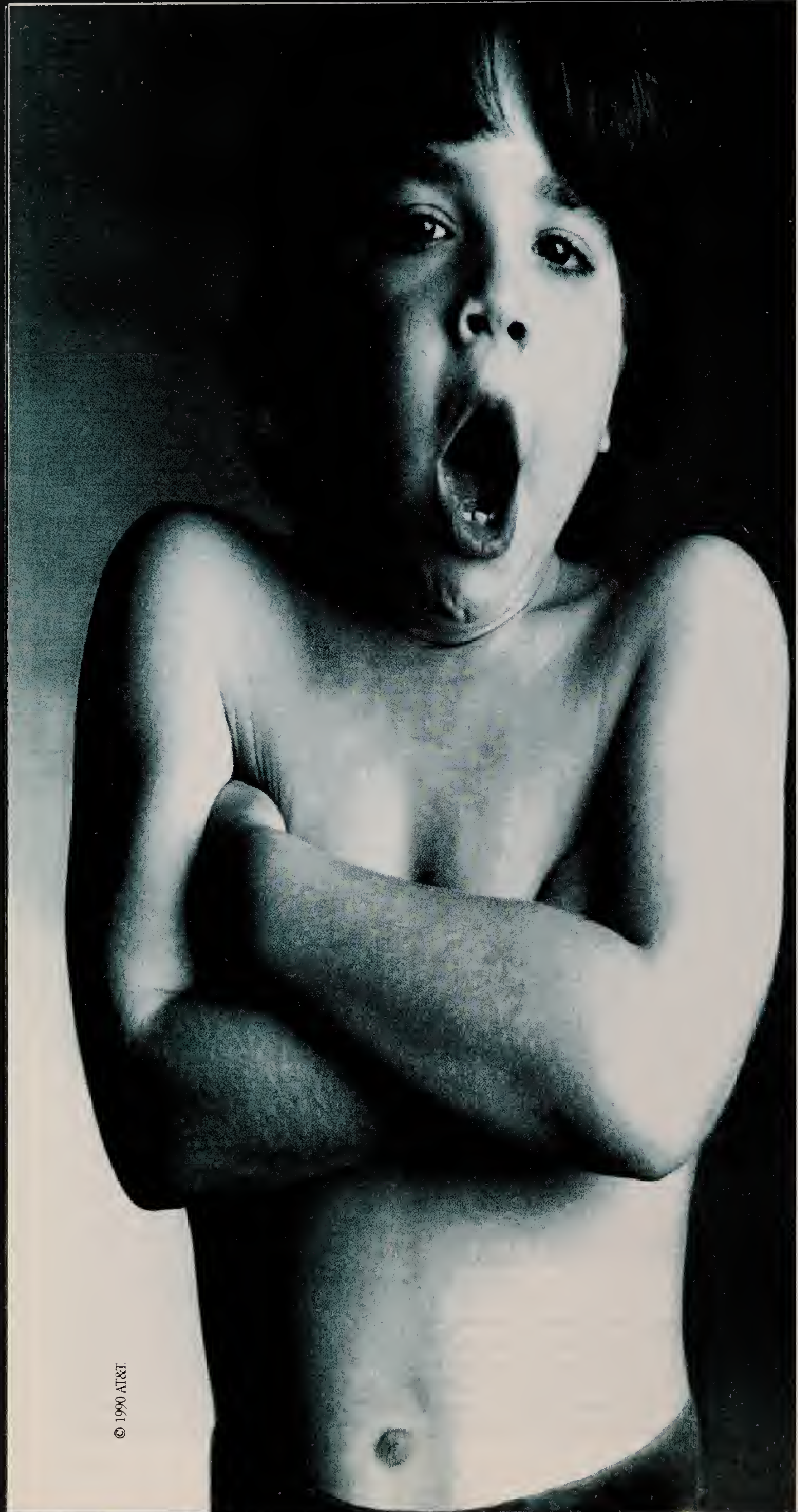
IS professionals aren't always doubting Thomases about new CIOs, however. Some are happy about changes at the top (see related story). And, sometimes, larger cultural influences hold sway over people's perceptions. For example, one mid-level IS official at a Western consumer goods company, who also spoke on condition of anonymity, thinks it's unlikely his firm's new CIO will leave. "People don't jump in and out of this company. [The company] doesn't tend to turn over their top executives very quickly."

Others hardly give a thought to how long a new CIO will stay. Gary P. Rietz, manager of information systems auditing at The Quaker Oats Co. in Chicago, considers speculation about the likely tenure of a CIO to be a waste of time. You might think a CIO will leave in three years, Rietz said, "but you never know."

Even in companies where frequent turnover is not part of the culture, adjusting to change at the top can unsettle the IS organization. Whenever there is a change at the CIO level, said Thomas Gaughan, senior vice president and CIO of Home Insurance Co. in New York, "there's a feeling of uncertainty in the IS organization. Longtime company employees are bound to be apprehensive."

Harris agreed. An ex-CIO's top lieutenants will wonder whether the new CIO will keep them on, he said. When a new CIO plans to switch vendors or change the technology base, IS staff members, at all levels, who do not know the new technology worry about job security and their future career growth. And when a CIO is replaced, the IS staff may take that as a sign that there is a "real lack of support [for] and credibility [of their department] among business management."

Moreover, said Harris, when a new CIO comes in, projects are often held up while the CIO considers what direction to take. "The folks who are there can get pretty disillusioned. They don't know what will transpire six months from now, either with their projects or the organization." The IS official at the Western consumer goods company was in just such a period of hiatus when he was interviewed. "We're waiting for things to happen," he said. "We're not producing anything. Programmers and analysts are wondering



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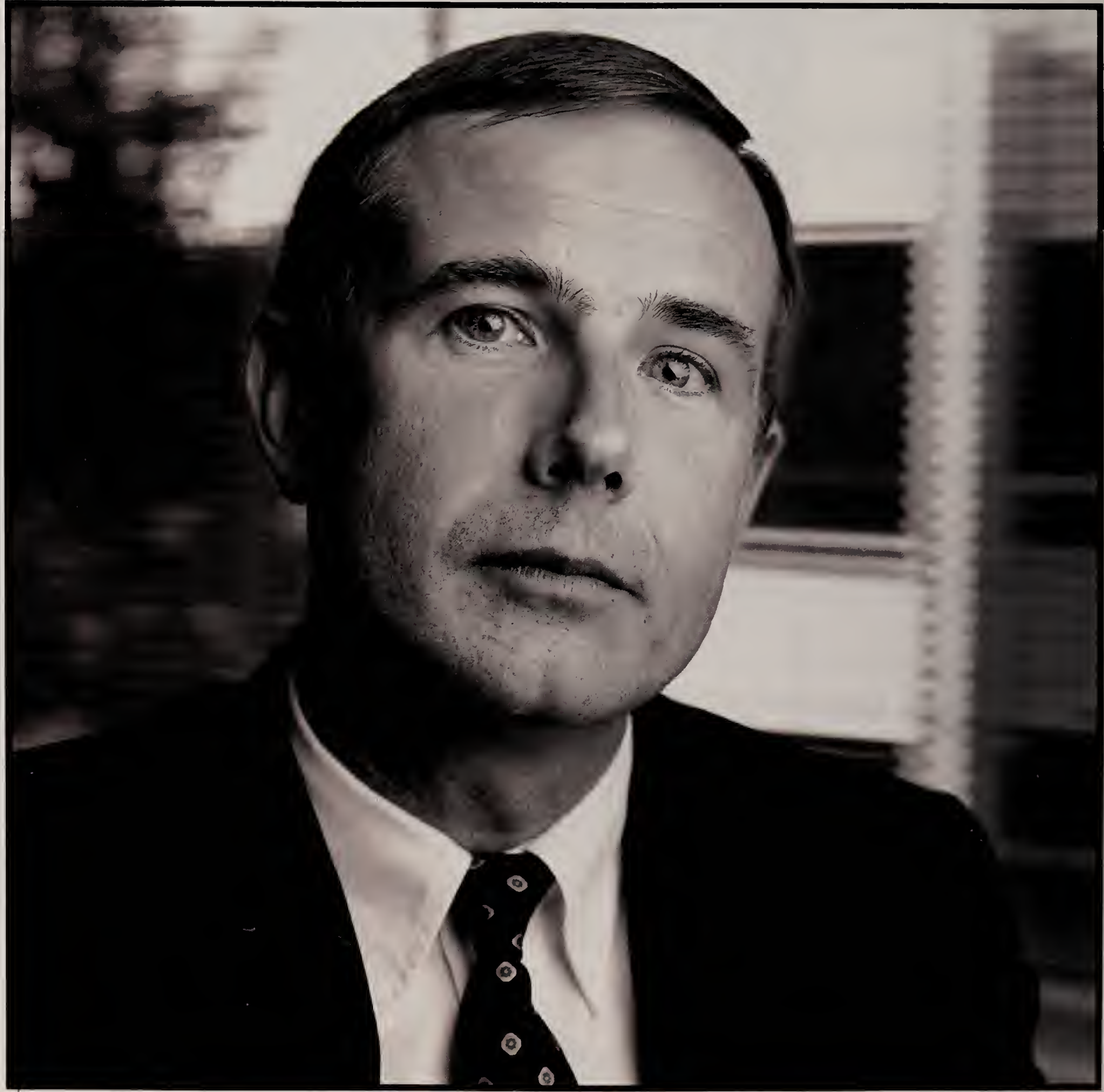

BILL REIHER: *As their responsibilities have expanded, Baxter IS staff have had to reassess their roles.*

what their [new] role is going to be." Even though the IS staff is pleased with the change at the top, the hiatus "is creating frustration," he said.

Ironically, when the new CIO finally decides on a course of action, uncertainty and insecurity may increase, not decrease. According to a mid-level IS manager for a major financial-services firm, who spoke on condition of anonymity, this is what happened at his company after the old CIO retired. The IS staff wasn't expecting the new CIO to attempt to change the IS organization's culture. But when the new CIO surrounded himself with lieutenants who were outsiders like himself and announced that IS would now become more business-oriented, the old-timers began to feel insecure. And not without reason—the new CIO is a hard-driving change agent. "People who weren't willing to fit into the new organization found themselves out on the street." Others left of their own accord. "I think we are going through a period of seeing who the tough ones are and who are not."

In the long run, this manager added, "all of this is for the good, believe it or not. We'll find ourselves as a company much stronger in the years to come. But it's painful right now." People miss the old way of doing things. "There was a feeling of being

PHOTO BY DAVID WAGENAAR

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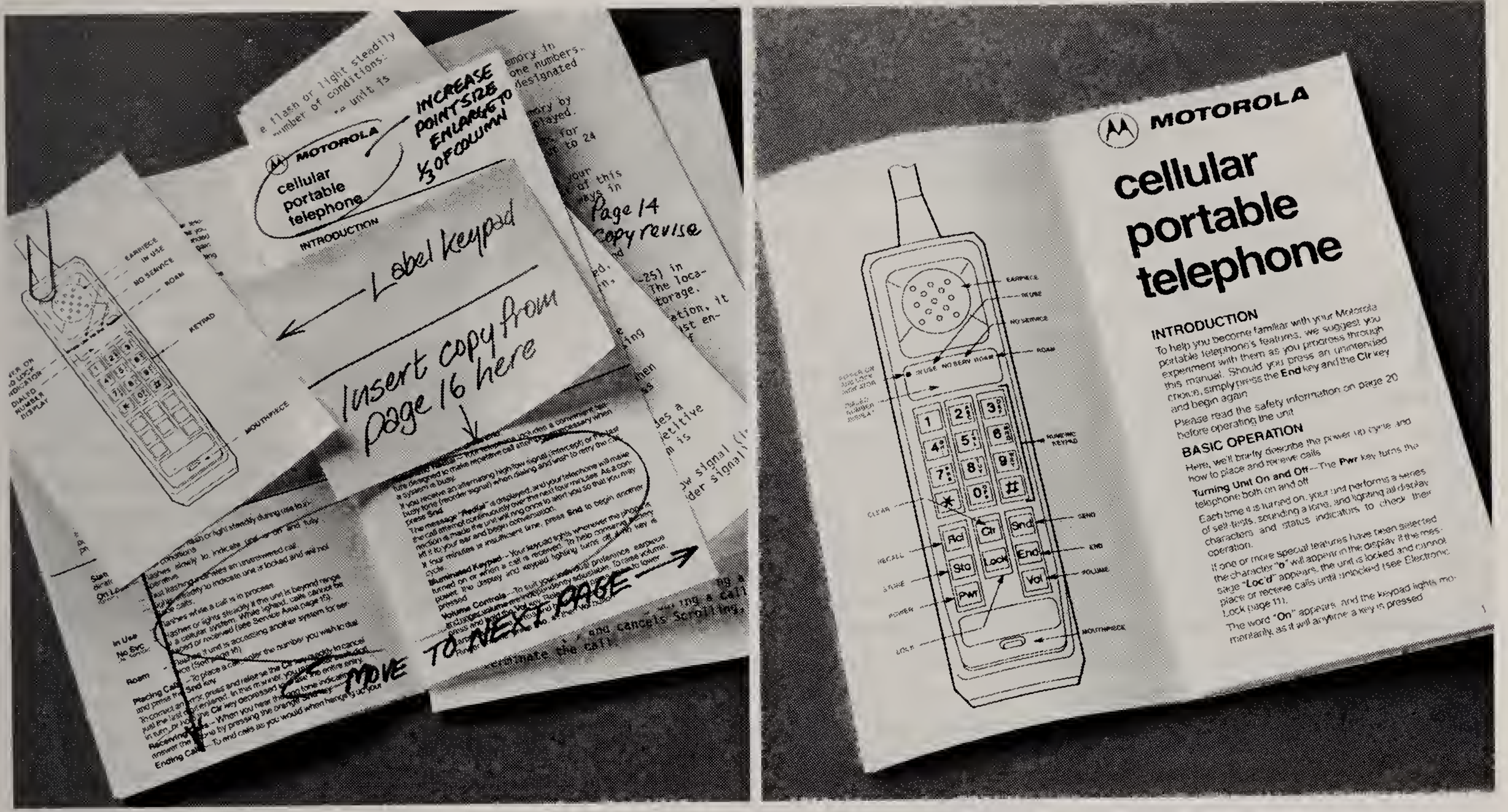
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Reorganizing the IS department is probably always painful, but when the CIO leaves in the middle of the process, the pain can be especially severe. Michael S. Heschel, for example, left Baxter International Inc. in the midst of a reorganization effort. After he left, Baxter's top executives decided to take more radical steps: They eliminated the CIO position and decentralized IS. These changes have taken a toll on the people Heschel left behind.

"In my case," said Bill Reiher, Baxter's director of corporate systems, "there have been some tough times. Everything used to come fairly easily. You could build on the past. Now that's changed. In some cases, we're redoing things [we've done before]. At times, it's frustrating."

The new regime has forced IS managers at Baxter to take on new and sometimes uncomfortable responsibilities. "It's good, because we've gotten a better appreciation of the business we're in," Reiher said. "But initially it's been viewed as negative, because we've viewed ourselves as DP people and now we're doing something different."

The loss of the highly regarded Heschel left many Baxter IS professionals with the impression, at least initially, "that we're losing our status, [we're] losing a CIO, and our value in the company is lessened."

These changes have created a field day for Chicago-area recruiters. "The headhunters spent a lot of time calling people up. I'm sure each and every person in DP thought about whether or not to leave."

Even Reiher came close to moving on. But 16 years of tenure and some attitude adjustment led him to change his mind and stay. "It's a matter of how you look at things. It's a new experience; you learn something new, [and] that's positive. But you don't see that initially. You see all the negative things." CIO

Calming the Waters

What can a CIO do about the organizational nervousness his or her arrival provokes?

The suggestions of those who have been through one or more changes of the guard (or are in the midst of one right now) boil down to eight points—which, we admit, are sometimes contradictory.

- **Set a clear direction that IS staff can buy into.** "The last thing you want the staff to feel is [that] you are just drifting with no purpose," said Gary P. Rietz, manager of information systems auditing at Quaker Oats in Chicago. "It's essential to put mission, strategy and objectives in front of people and make sure [they] understand them, buy into them, and execute them. If you don't get the direction from the top, and [you believe that the CIO] is just there for the ride, ill feelings get started."
- **Postpone ambitious plans until basic functions run smoothly.** To borrow an analogy from the transportation industry, "Don't talk about setting up new routes . . . and running a travel service until you get the bus running reliably," said Ron Brzezinski, a consultant in the New York office of Coopers & Lybrand. "Until you have skills, equipment, and [adequate] service levels, you can't really do anything of significance."
- **Gain the support of the senior IS managers.** To do that, according to consultant and former CIO William N. Harris, a CIO must convince his or her IS managers of three things: They need to more closely align the department's mission with top management's expectations; the CIO's new direction will not be beyond the department's ability to absorb change; and those who remain will be part of the new management team.
- **Negotiate for public, credible support from senior corporate executives.** Don't sign on as CIO, said Harris, unless top executives agree to answer this question in front of the IS staff: "Why should you guys stick your necks out for the new CIO when you've seen the last three come in and out the door?" But he cautioned that "people will respond in direct correlation with how much credibility executive management has."
- **Gain the active support of senior line executives for your agenda.** According to the not-for-attribution IS manager from the East Coast consumer products company, this is the only way to break the control that end-user managers have over their IS counterparts.
- **Insist on having the freedom to punish and reward.** "The CIO has to have control over the personnel in his organization. He has to have the freedom to hire and fire, and the freedom to reward and punish, in order to make his organization aware of where he wants to go, and that it's not business as usual [anymore]," said the East Coast IS manager.
- **Do not change faster than the IS organization is able to absorb change.** "The pace of change has to be tempered, based on the culture of the company, economics, and the ability to introduce change in the organization," said Home Insurance Co. CIO Thomas Gaughan. CIOs must be able to understand an organization's cultural limitations and opportunities.

Perhaps the most important tip comes from Whirlpool's Richard Koeller. New CIOs must put the ability to absorb change, both by the IS organization and the users, at the top of their agendas, instead of initially focusing on technology. "It's not that the other issues aren't important," he said, "but they tend to get done [as a matter of course]." *—A.E. Alter*

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INFORMED SOURCES

BY PAUL KONSTADT

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“I view intelligence as the grease of the decision-making process. We stay very close to the executives who are wrestling with the decision and get most of our direction from them.” –*William Sammon*

Advocates of BI programs say the paybacks are huge. “I’ve seen companies save many millions of dollars by learning news in advance,” said Leonard Fuld, a consultant in Cambridge, Mass., who helps corporate clients develop their intelligence activities. He cited the experience of the Coors Brewing Co. of Golden, Colo., as one example.

It was 1987, and the beer-industry rumor mill was convinced that mighty Anheuser-Busch, the nation’s largest beer producer, was preparing a multi-million-dollar marketing blitz to flood Coors’ core market in the Rocky Mountain states with Busch Beer. The St. Louis, Mo.-based Anheuser-Busch had not yet made any overt moves, but the pressure for a decisive response from Coors would be high. A preemptive marketing counteroffensive against Busch beer would cost Coors millions of dollars—money that would have been misspent if the rumors proved to be false. On the other hand, the failure to respond to an actual incursion could cost Coors even more in lost market share and profit.

At many companies, knowing what to make of the rumors would have called for equal parts of gut feeling and guesswork, but at Coors, the evaluation was based on precise information, astutely analyzed: Coors executives had determined that Anheuser-Busch’s breweries in the region simply “couldn’t produce enough beer to back up such an effort—no way,” said Jim Leonard, Coors’ manager of competitive analysis. Based on that assessment, no action was taken by Coors, and as of this writing, Anheuser-Busch had still not pushed its Busch brand forcefully into that market.

Intelligence gathering may be the first management hot button of the 1990s. When Fuld polls the attendees at one of his seminars, he finds that the vast majority have intelligence programs (although virtually all began them only in the past year or two). And when Phae Dorman, manager of the business information center at Dow Chemical Co. in Midland, Mich., began clipping articles on the subject of business intelligence, her file quickly grew to be more than two inches thick. Collectively, the articles revealed to her a sense that “people are searching for some . . . way to become more profitable.” However, she added, while companies’ intelligence efforts “seem to be intensifying, they’re not really sure how to go about it.”

While the terminology of business intelligence might appear to suggest illicit information gathering, most of what is gleaned is in fact a matter of public record. The key to successful business-intelligence efforts lies not so much in what is discovered but in how it is distilled and analyzed. According to Leonard, “almost all of the information [Coors] collected on [Anheuser-Busch] and their brewing capacity are things that [Anheuser-Busch has] said at one time or another. The information was there for the picking.”

Building an effective intelligence capability depends on the company, say experts familiar with the process; the approach must be custom-designed to fit an organization’s individual needs. “A large part of it is the culture of the company,” said William Sammon, director of planning for New York-based Pfizer Inc.’s U.S. pharmaceuticals group. “We don’t have any intelligence system per se, because it has become a routinized part of the way in which executives here view their function. [No one goes] forward with a plan unless it includes a detailed evaluation of the competitive environment.”

In order to help assure that intelligence assessments are considered regularly at all stages of the planning process, Pfizer business plans are produced by teams that generally include intelligence analysts and information executives as well as product and marketing specialists. The team members from the intelligence and IS functions provide distilled business intelligence data, while the executive leading the team makes the ultimate assessment of the information’s value and meaning. “I view intelligence as the grease of the decision-making process,” said Sammon, whose background includes market research and securities analysis. “We stay very close to the executives who are wrestling with the decision and get most of our direction from them.”

Team members from the systems staff may spend half their time or more working on the team project. To be truly effective, “[they] need to understand the information [they] are gathering: what it means, what its implications are, what its sources are, how it can be used,” said Vita Cassese, vice president of systems at the pharmaceuticals division.

One example of Pfizer's interdisciplinary approach is the company's ongoing program to track pharmaceutical drug prices worldwide. The company's sales force watches direct competitors and reports on their pricing and marketing moves; the systems people maintain a detailed database of information on the worldwide drug marketplace; and Sammon directs a research staff that combs for raw data to add to that database, looking for any "nuance or insight" they can report back to those in sales and marketing.

At the opposite end of the organizational spectrum from Pfizer's mainstream intelligence activity is Dow Chemical's business information center. Where Pfizer stresses the virtually automatic inclusion of business intelligence in each decision-making procedure and line executives' mastery of information-analysis techniques, Dow supports a team of skilled research librarians, led by Dorman, to act as an available-on-demand resource for its executives. The team's expertise at navigating the intricacies of all available information sources often makes for more elegant searches, but it also creates some impediments. "We don't often see the whole picture," Dorman said. "Part of our challenge is to draw enough out of [company executives] to figure out what they need. . . . The more pieces to the puzzle we have, the better able we are to fit the search."

Other companies fall between those two poles of organizational style, using intelligence data on a more ad hoc or situation-specific basis than Pfizer, but with intelligence experts who are closer to the senior management team than those at Dow, advising decision-makers while making few of the ultimate judgments themselves. One such organization is Coors' intelligence unit. Leonard, who leads that effort, joined the company as a project engineering manager. He had organizational exposure in middle management, but no formal background in business intelligence when he learned that senior Coors marketing executives wanted to have someone in-house to evaluate other brewers' marketing activities. "I had wanted to get into strategic planning when this opportunity came along," he recalled. "This was back in 1981, and no one knew anything about how to do it."

Since moving into his current role, Leonard has become, in his own words, "self-taught" in the art of second-guessing Coors' competitors, trying to "predict what their future strategies are going to be." Leonard's analyses—the Anheuser-Busch estimate being perhaps the most famous—are fed to the sales and mar-

Hot Off the Network

. . . .

Lincoln National will soon begin publication of an in-house, computer-assembled and -distributed news digest

What may be the business world's first electronically assembled and distributed newspaper should begin publication soon at Lincoln National Corp., the Fort Wayne, Ind., financial services and banking firm. Designed to replace the hard-copy daily news digest presently prepared by the company's corporate information staff, the computer-edited morning report will be sent via the corporate electronic-mail network to some 2,000 Lincoln National headquarters employees.

Making the editorial choices for this automated newspaper is a text-retrieval and intelligent-correlation package called Metamorph from Thunderstone Software of Cleveland. Metamorph, which is based on software first developed for U.S. government intelligence analysis, will be used to scan the full text of all news stories as they are transmitted by the major wire services and then pull out only those items that contain information of interest.

Metamorph selects text by actually assessing its meaning rather than by simply looking for key words and matching them to a predetermined list. It is designed, for example, to pull out items about revolutions and civil wars even if the user only offers an initial description like "political turmoil." The software can also be used to search for text containing key concepts stored in virtually any machine-readable database, whether online or stored on tape, diskette or CD-ROM.

With these capabilities in mind, Lincoln National is storing all incoming news items electronically, along with E-mail messages and reports, so they can be searched for later reference. The company is even considering asking executives to build electronic files of things like their descriptions of the business situations they encounter and the difficulties they resolve. These collections of anecdotal information, too, would be searchable by Metamorph.

—*P. Konstadt*

Where Pfizer stresses the virtually automatic inclusion of business intelligence in each decision-making procedure and line executives' mastery of information-analysis techniques, Dow supports a team of skilled research librarians to act as an available-on-demand resource for its executives.

keting organization, which then uses them to guide their own efforts.

Business-intelligence systems rely on a variety of technologies. For instance, CD-ROMs—devices the size of a small book that play standard-sized compact disks holding a quarter-million pages of information each—put almost immeasurable amounts of readily searchable data within easy reach. Among the commercially available CDs relevant to intelligence gathering are real-estate transfer records, court decisions and case files, government-mandated financial reports, encyclopedias and technical reference works.

Online databases contain the latest developments in virtually every technical area, up-to-the-minute news summaries and reports, and such timely data as current Securities and Exchange Commission filings, court decisions and product announcements (see related story).

Expert-systems-based search and screening systems sift through entire texts to find key words or even vaguely defined concepts, then automatically extract the relevant material. They can also help users define search parameters, then adapt those protocols as the users' interests or information needs change. The fastest and most robust of such tools can sift through hundreds of pages of text per second but may cost a quarter-million dollars or more to implement, as Leonard found on a recent shopping trip. But even at that price, the potential of being able to find an important piece of information buried in a massive database is awfully alluring.

Said Leonard, "We've had this happen so many times: The vice president of marketing says he wants to know something right away. I go to the file where I think it would be, but it's not there [because] someone else with a different idea had filed it differently. . . . We have failed to come up with information people need just because of that, [and] it's frustrating."

Among the more generic technologies used in intelligence gathering are spreadsheets, which allow for the correlation of innumerable bits of data into coherent portraits; electronic mail and teleconferencing, which facilitate the high level of communication needed by effective intelligence operations; and powerful desktop computers, which provide the raw computational muscle to take full advantage of the other items. Most of these IT tools have come to be used widely for intelligence in part because they are already in broad use for other functions, and therefore are handy when the need arises.

While information and intelligence executives praise their electronic data assets, they also stress that non-technology-dependent resources provide vital information as well. At Dow Chemical, for example, membership in chemical- and pharmaceutical-industry trade associations provides researchers with access to a wealth of information, according to Dorman. "To ignore those things is a very dangerous attitude to take," she said. "You may be missing a very important piece of the puzzle if you think you looked at everything by just using online databases."

Sales forces in the field can also provide substantial data. For example, simply walking through retail stores can tell a great deal about competitors, according to Sidney Diamond, vice president of worldwide information services at Black & Decker Corp. of Towson, Md. "You can see what your competitors are doing [and] how much shelf space they have," he said. At Coors, according to Leonard, field salespeople have a special hot-line telephone number to call with any scrap of information they might pick up. "We tell them: 'Keep your ears to the ground and don't worry about overkill. Just because others might not recognize it doesn't mean it won't prove to be important.' "

Assembling the information is only the first part of the intelligence process. Without carefully weighing the facts and analyzing the patterns, looking at intelligence data is "like the blind men and the elephant," said Fuld, with no one certain about the real nature of what they are touching. Fuld advocates a technique he calls "intelligence by walking around": people talking face to face about the individual facts that have been gathered until the patterns become clear. That's also the best way to see that valuable information finds its way to the people who might need it, he added, because "you cannot possibly anticipate who is going to

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need what piece of information at what point in time."

The evaluation process can itself be tortuous, according to Pfizer's Sammon. "You need to have a base of knowledge to ask, 'Does it fit or doesn't it?' " Intelligence that seems to contradict prevailing wisdom signals the need for more investigation. "Just because it doesn't fit, don't discard it. . . . It may be valuable." Sammon also advises novice analysts to be careful that their sources are not all talking to each other, passing the same information around while making it appear that each knows it independently. That "echo effect" can lead the analyst to give more weight to something than it actually deserves and "leads to group think," he said.

Most information executives today would not even try to imagine how specific corporate functions could get by without IT tools. But in the intelligence area, Cassese believes that the loss of computers would simply be a problem to work around. "If I had one tool I could hang onto, it would be my human resource," she said. "I wouldn't be able to survive without the people who understand the information."

Corporate economic survival today depends on more than just effectively controlling an organization's internal functions; it requires being able to understand and exploit the business environment it shares with its competitors. "Every company is privy to the same basic information," said Fuld. "The ones that win are the ones that know how to use it in their own organizations." CIO

Intelligence Packages

A variety of news-search and -filtration services are providing companies with a concentrated dose of custom-focused information

A new family of information services is using computers and advanced software to distill the daily flood of business-related news into a concentrated, potent resource for executives and analysts. All rely on filtering devices that continuously monitor significant business-information and news organizations. Some supply daily summaries by fax, E-mail or postal service, while others offer equipment that signals users immediately whenever a noteworthy item is transmitted by any covered source.

The most timely of these new services is called NewsEDGE, offered by Desktop Data Inc., of Waltham, Mass. NewsEDGE provides instant notification whenever a relevant story is transmitted by any wire service selected by the customer. The service screens all traffic and searches for stories that contain any of the specific key words chosen by the subscriber. In addition, the service provides for the storage of all traffic for a period of time to allow for subsequent searches if the subscriber's interests or needs change. NewsEDGE uses software and transmitting gear provided by Desktop Data, but the actual processing and storage takes place on the subscriber's own personal computer.

Less timely, but also less dependent on desktop electronics, is the service called First! offered by Individual Inc. of Cambridge, Mass. First! provides a daily compendium of stories of note that can be delivered by fax or electronic mail for reading first thing the next morning. First! searches many of the same sources as NewsEDGE—but it uses a more sophisticated screening technique that can analyze the concepts in the text and find stories of note even if they don't contain any of the key words specified by the subscriber. At present, First! covers only stories of interest to the high-technology industry, but according to company President Yosi Amram, the industry range will be expanded in the coming months.

The Executive Briefing provided by Western Union of Upper Saddle River, N.J., uses similar full-text searching technology, but not on the daily news stream. Instead it scans the latest week's additions to whichever of the hundreds of information databases might be of interest to the particular subscriber and provides a weekly report. —*P. Konstadt*

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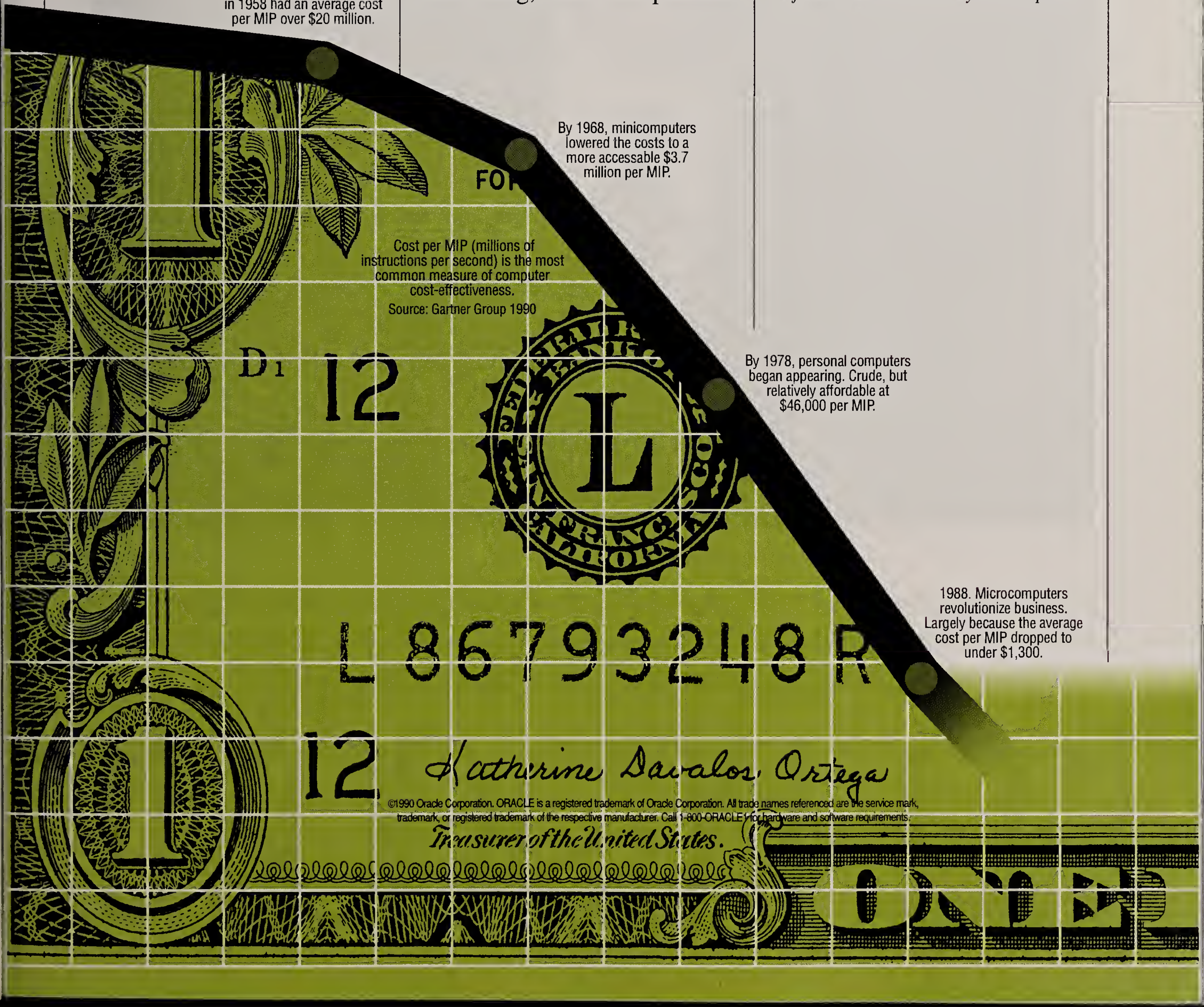

The room-sized computers in 1958 had an average cost per MIP over $20 million.

By 1968, minicomputers lowered the costs to a more accessable $3.7 million per MIP.

Cost per MIP (millions of instructions per second) is the most common measure of computer cost-effectiveness.

Source: Gartner Group 1990

By 1978, personal computers began appearing. Crude, but relatively affordable at $46,000 per MIP.

1988. Microcomputers revolutionize business. Largely because the average cost per MIP dropped to under $1,300.

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PHOTO BY JOSEPH BERGER

Microcomputers used to be regarded by CIOs as a threat to their authority. Now they are embraced as a corporate asset, valued as a tool for evangelizing IT's strategic potential, and managed with respectful deftness.

PCs COME

BY LESLIE GOFF

The word CIOs use most often in discussing personal computers is control, but in the 1990s control does not imply forcing the IS department's technical vision of computing on the rest of the organization. That idea, in fact, has become taboo. "The whole concept of grabbing control of PCs is wrong; you don't do that," said Michael Simmons, group executive and executive vice president of technology and operations at the Bank of Boston. Instead, control is about managing what has come to be viewed as today's key corporate asset: information.

CIOs' key concerns revolve around how to move mission-critical applications from mainframes and minicomputers to networks of personal computers without losing control of data access, integrity and consistency. This involves providing both security and support and maintenance. And while user training is also important, most CIOs look to improved interfaces as the key to minimizing the training expense without skimping on users' needs.

Concerns about technical issues, such as choosing a hardware platform and assuring compatibility and connectivity, have lessened as companies move toward open architectures (see related story); and although companies continue to have concerns over purchasing control, price/performance and overall cost, these have shifted from the top of the list to the bottom.

This has all changed from a decade ago, according to Stuart A. Walker, vice president of business information systems at United Research Inc., a Morristown, N.J.-based consulting firm. "CIOs have really come full circle on PCs," he said. "[They] were terrified in the beginning. They looked at PCs as eroding their empire."

STUART WALKER *(left) sees a change in CIOs' perceptions;* **DAN SNYDER** *(above) believes that "PCs are overbought."*

PHOTO BY ROBERT MERCER/GAMMA LIAISON

Today, Walker continued, CIOs believe that PCs have made their jobs easier. For one thing, employees are more aware of the empowering benefits of technology, so the messianic role of the information systems professional is simplified. PCs have also helped to reduce the pressure of the applications backlog by enabling users to take more responsibility for their own computing needs.

Such empowerment has its drawbacks, however: For every application created on a PC, there is a collection of data that may be needed by but not be accessible to other parts of the company, Walker said. "So the CIO's task now is to be sure [that] the data that is collected, stored and manipulated on PCs is accessible to others and consistent with the data on other PCs."

That is a tall order for CIOs, as well as a source of irony. What were once considered "toy" computers have become, in the 1990s,

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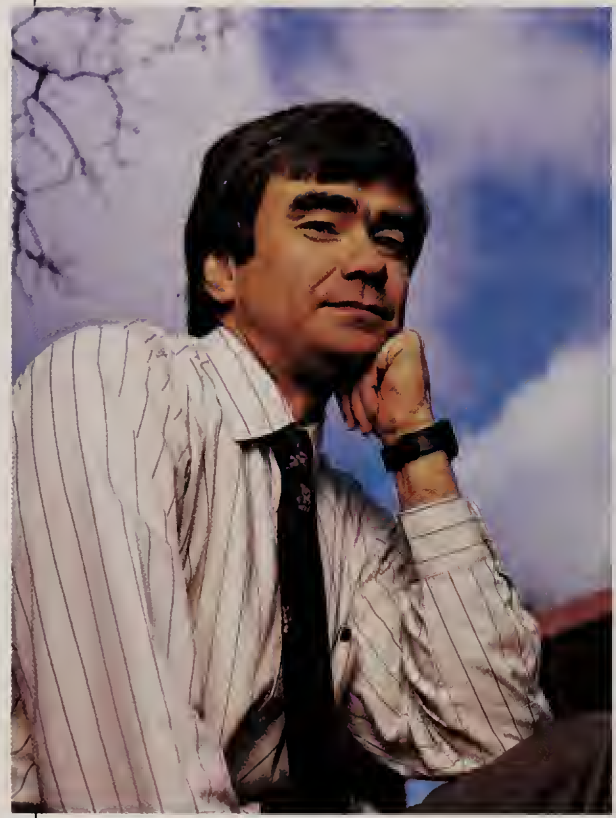

NEAL FRANKING: *building a corporatewide PC infrastructure*

> *"When there is inconsistency across the enterprise, you can't really leverage the corporate data asset. It's like pre-1992 Europe. Each individual country can't be as effective when everything is done differently from nation to nation."*
>
> *–Neal Franking*

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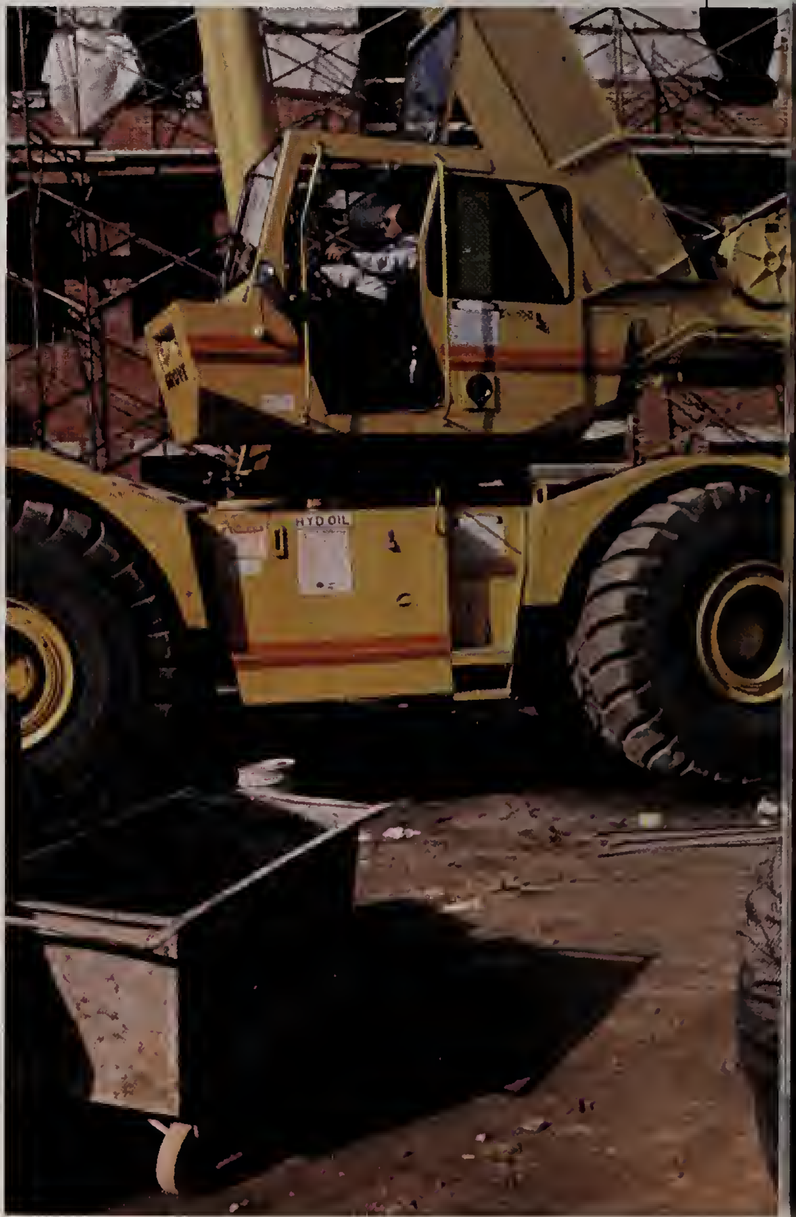
harbors of key corporate data and a necessary tool at all levels of the organization. Just as managing the rapid proliferation of stand-alone machines was the PC management challenge of the '80s, managing the data dispersed throughout an organization on networked PCs will be the challenge of this decade.

The CIO is better positioned than anyone else in the corporation for "managing the enterprisewide issues and leveraging the enterprisewide resources," said Neal Franking, director of corporate information services at Intel Corp. in Folsom, Calif. Intel is in the process of establishing a corporatewide PC infrastructure under which its 14,000 employees worldwide will be able to store and access data in a consistent manner.

Franking's vision of a corporatewide PC infrastructure grew from evidence that each of the company's 11,000 personal computers was used only about two hours a day. Intel's PC productivity rate is not atypical; much of the current focus on using PCs as true data-processing vehicles arose from the need to get higher returns out of the huge investment in hardware and software. "And so, how you take advantage of that resource more effectively becomes a concern," he said.

According to Franking, creating the infrastructure involves a long list of system management issues, the most immediate of which concern the consistency of data storage and access. "When there is inconsistency across the enterprise, you can't really leverage the corporate data asset," he said. "It's like pre-1992 Europe. Each individual country can't be as effective when everything is done differently from nation to nation. . . . We want an employee in Munich to be able to access information that may also be of interest to a worker in Tokyo."

Building such an infrastructure is a long process, however, even for the company that designed and manufactures the engine of the IBM-compatible personal computer. Franking estimated that it would take until the mid-1990s to complete. The company is standardizing on its own 32-bit chips—'386 and above—to avoid future architectural changes. Using E-mail (currently the only common application across the entire company) as a springboard, consistent access and storage methods should be in place by the middle of

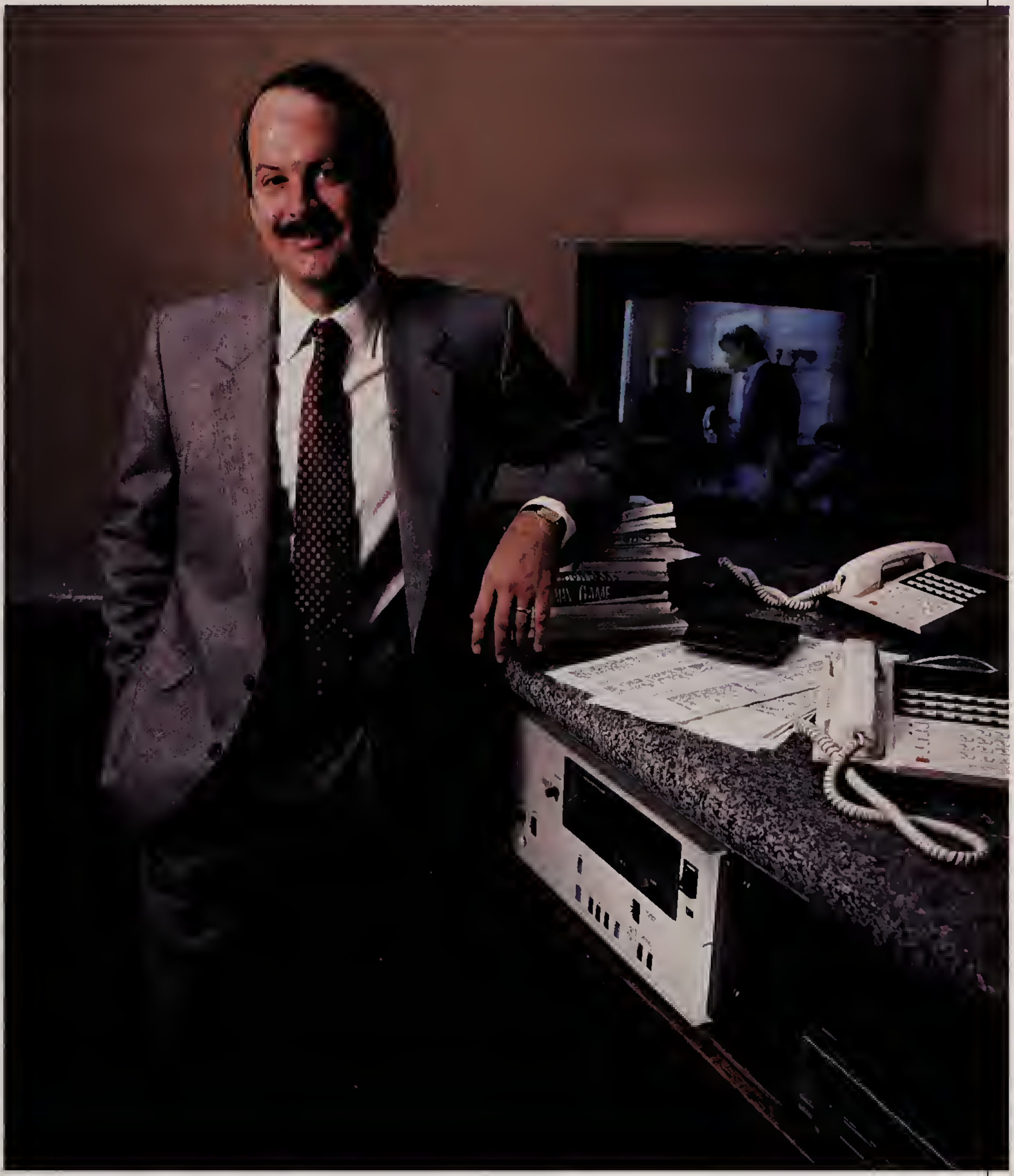


JOSEPH WINSTON: *combating chaos*

PHOTO LEFT BY CINDY CHARLES; PHOTO CENTER BY JOHN KENNARD

next year. Then the company will distribute data management and client/server computing, "but all of the technology won't be in place for several years," he said.

Intel's approach to personal computing illustrates what Bank of Boston's Simmons referred to as the three essential layers of information systems planning: a strategic business plan, a tactical plan and a technology plan. The tactical plan determines which areas of the company need personal computers and/or networks to enable workers to carry out the strategic business plan. The technology plan stipulates what types of hardware and software are necessary to support each part of the tactical plan. "Then you exercise as much control as necessary to keep the corporation out of trouble," Simmons said.


ALEX HENRY: *The interface is key.*

Is it possible, however, to keep the company out of trouble without exerting complete control? Some CIOs believe that less is more when it comes to personal computers. Among the PC skeptics is Dan Snyder, vice president of MIS at Tyson Foods Inc., of Springdale, Ark., who said that "PCs are overbought." Snyder, whose department supports about 700 users in 30 locations in 11 states, spearheaded a move to distributed networks of Digital Equipment Corp. VAX minicomputers, MicroVAXes and terminals when the company had to upgrade its Sperry equipment. In Snyder's view, personal computers present corporate and data security problems.

"One of my big concerns is the human nature of people failing to back up data with the frequency necessary to ensure [its] safety," Snyder said. "And we have big security concerns. Anyone with half a brain about PCs can come sit at your PC and call up sensitive information. That's why its better to have information residing on a [central computer] where it's secure and safe."

Data security was also a major concern to the William Morris Agency Inc., the world's oldest and largest talent agency, based in Beverly Hills, Calif. The agency is standardizing on the workstation from NeXT Inc. as the main tool for its entertainment agents. "Our business is information: who you know and things of that sort," said Alex Henry, director of MIS. "We're very sensitive about our

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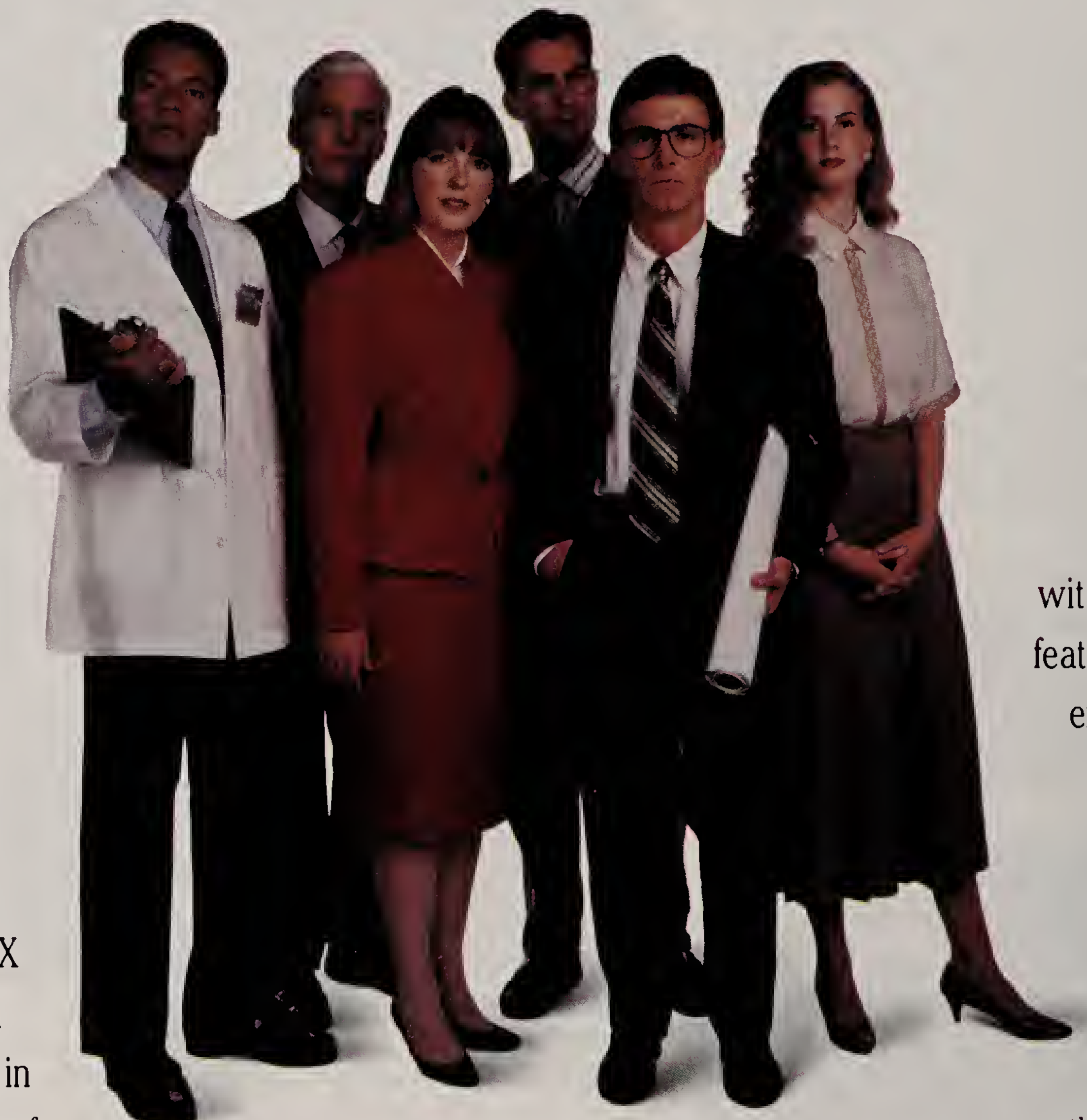
What does Compaq give 386 users who expect the moon?



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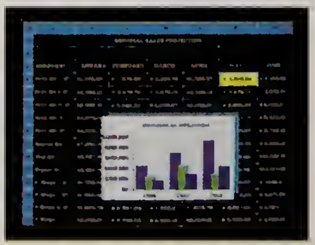

The COMPAQ DESKPRO 386s Personal Computer is also designed to handle general business applications. Its 16-MHz 386SX microprocessor gives you exceptional 386 performance. And its 32-bit architecture lets you run today's popular business software. It also offers the flexibility to run tomorrow's advanced business software.

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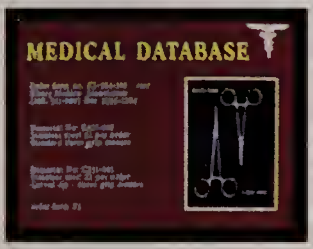

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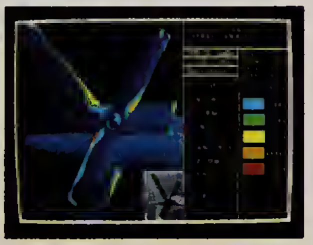

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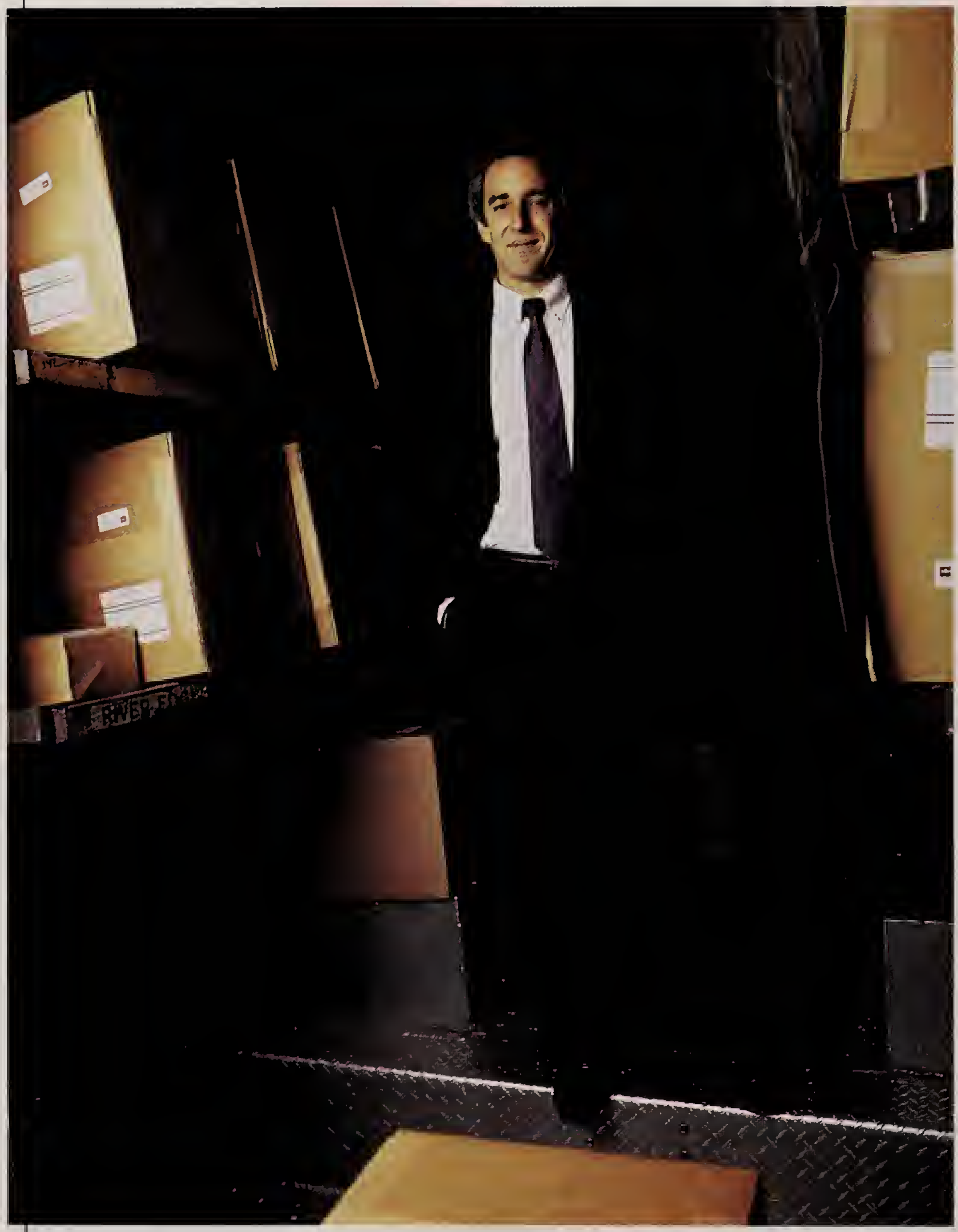

STEVEN HEIT: *providing central service and support*

PHOTO BY JOSEPH BERGER

data." Consequently, although the NeXT comes standard with an optical disk for greater storage capability, the company only equips individual agents with 40M hard disks; optical disks containing sensitive corporate information are used only on servers, which are kept in secure areas and are only accessible with security passes.

Tyson's Snyder said that in addition to protecting corporate data, centralized minicomputers enable him to provide productivity tools to dispersed users more easily. "There are a lot of capabilities [graphics packages, the ability to crunch numbers] that work better if everyone is able to access them from one point," he said. "PCs tend to create islands, and that bothers me. The organization should be more controlled and integrated."

Related to CIOs' concerns about control are support and maintenance issues: If key corporate data and applications are out on networked PCs, those networks must be up and the information contained on them easily accessible at all times. In fact, ensuring ease of use is a crucial part of CIOs' support and maintenance strategies. The well-publicized emphasis on the human interface is not just lip service. For instance, the NeXT workstation's interface was one of the key reasons William Morris chose the system over two other options (extending the agency's existing PC networks or installing AS/400 networks). According to Henry, the NeXT's interface is extremely easy to learn, all shrink-wrapped products are provided with the same conventions and menu structures, and it requires only one touch of the mouse to move from one application to another and back again.

The company has about 150 workstations now supporting agents in the motion picture, literary, talent and commercials niches, "most of whom had never used a computer before and are too busy to [be trained]," Henry said. "The people here are not hackers; they are people who need to get their jobs done, and we're supporting that.

"We've come a long way in one year," Henry continued. "There are 150 people using computers that before were mostly using manual processes. I don't think we would have the usage that we have if we had gone with the traditional PC interface."

May Stinson, director of information systems planning and consulting for Dun & Bradstreet Corp. in Wilton, Conn., has a unique perspective on the interface issue. She is not involved with internal PC use but rather with how the company's customers can use their own PCs to access the company's information-based products.

"We're building electronic windows into our data, with PCs as the vehicle for that," Stinson said. "How well we do the dialogues—the human interfaces—is key. . . . We try to improve the quality of how the PC marches you through the discovery process."

Stinson believes that the extensive capacity of PCs to differentiate interfaces provides fertile ground for new development approaches. "With the PC you can be more creative and clever about how you develop those dialogues," she explained. "The industry needs to develop more expertise in that area. That gives rise to a new discipline: people who specialize in well-done dialogues—humanists vs. technologists."

One of the prime benefits of improved interfaces is the reduction of training time, which results in increased productivity and lowered expenses. "If you build dialogues right, the training will be minimal," Stinson noted. "A lot of vendors tell you their software is easy to use and requires a five-day class to train. That is not easy software."

The traditional support and maintenance concerns of keeping users up and running remain as critical to CIOs as ease of use, particularly in networked environments. Moreover, the difficulty of providing these services can be justification for implementing controls that independent users may resist.

"As more applications move to the PC, users take more responsibility [for their own computing needs], and this creates control and support issues," noted Joseph Winston, corporate director of MIS at Gilbane Building Co., in Providence, R.I. "How can I support you if I don't know what you have? You need controls to provide support."

> *"We're building electronic windows into our data, with PCs as the vehicle for that. How well we do the dialogues—the human interfaces—is key. . . . We try to improve the quality of how the PC marches you through the discovery process."*
>
> *–May Stinson*

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The difficulty of providing PC support and maintenance can be measured by the tremendous increase in outsourcing; IS departments frustrated by their lack of control often decide to just give the problem to someone else. Other practices include sticking to a limited

PC also Stands for 'Plan Coherently'

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When it comes to managing a company's personal computing technology, CIOs must give greater weight to the organization's long-term architectural direction than to the allure of slick technology

According to Stuart A. Walker, vice president of business information systems at United Research Inc., of Morristown, N.J., CIOs must choose hardware platforms that will best suit future computing needs without sacrificing the existing investment.

JOSEPH WINSTON: *making long-term architectural decisions*

PHOTO BY JOHN KENNARD

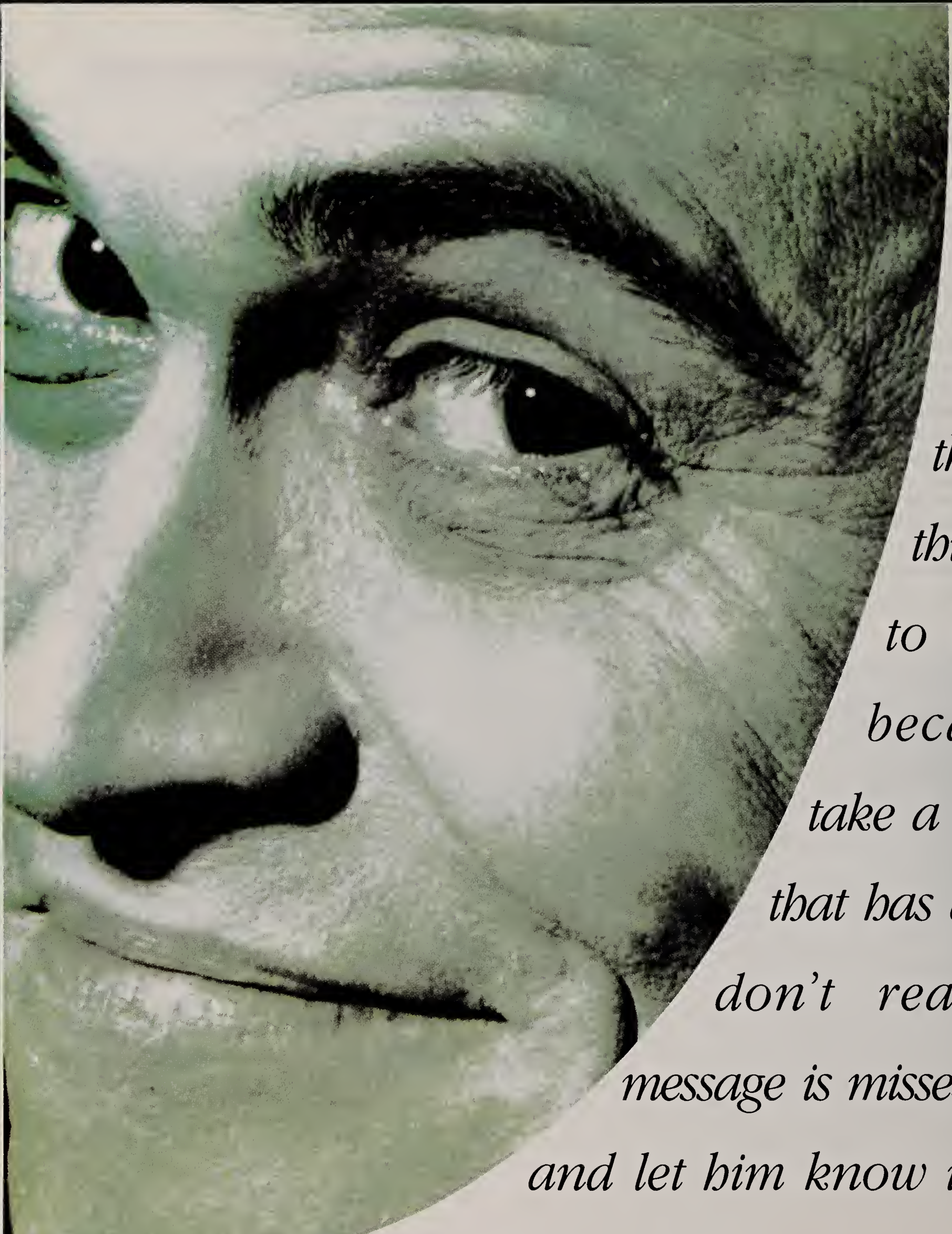
When Gilbane Building Co. of Providence, R.I., installed its first local-area network, it chose the OS/2 LAN Manager over DOS because it eventually plans to upgrade the minicomputers the LAN now interfaces with to an AS/400. "There were things that our dealer showed us in terms of connecting an OS/2 server with an AS/400 that didn't seem possible with DOS," said Joseph Winston, Gilbane's corporate director of MIS.

"It becomes a matter of long-term architectural decisions," Winston continued. "What will give us the greatest flexibility over time? This LAN is for very specific needs that will change over time. So we try to polish up our crystal ball and anticipate what those changes will be."

Obviously, making long-term technical decisions requires keeping abreast of technology developments. "You should always be working with what's in the marketplace," said Michael Simmons, group executive and executive vice president of technology and operations at the Bank of Boston. "Once you close your mind, you lose." Simmons has an Advanced Technology Group that reports to him and covers what's going on in the PC world. "It is a true R&D group that looks at everything, whether it's in our bag of tricks or not."

But CIOs must be careful not to get distracted by technology, according to Neal Franking, director of Intel Corp.'s corporate information services in Folsom, Calif. While his group keeps up with technology "every which way we can . . . ," he said, "the focus of the future needs to be more around management systems and less around worrying about where the hardware is going."

Walker agreed. "What is important," he said, "is the idea of understanding what information is on PCs, how it is kept current, and if it is being used throughout so that the company is getting consistent calculations." —*L. Goff*



We send
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up satellites like flowers to strangers. On one we
electronic greeting card and addressed it to infinity.
occurs to me, what if the people who might get
signal from planet Earth aren't around when it gets
if they're in a meeting? And the only reason I'm
is because I'm on the tenth ring of the third call
supplier when someone finally answers the phone
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And I say, "Tell Ray he needs to work for a place
System from AT&T. Tell him 75% of all business calls
intended party on the first try. But with AUDIX no
AUDIX features outcalling that can page him
messages are waiting. And this is important because
reach him and they may not call back...." At this
intelligent life somewhere in the universe, it is not

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"As more applications move to the PC, users take more responsibility for their own computing needs, and this creates control and support issues. How can I support you if I don't know what you have?"

–Joseph Winston

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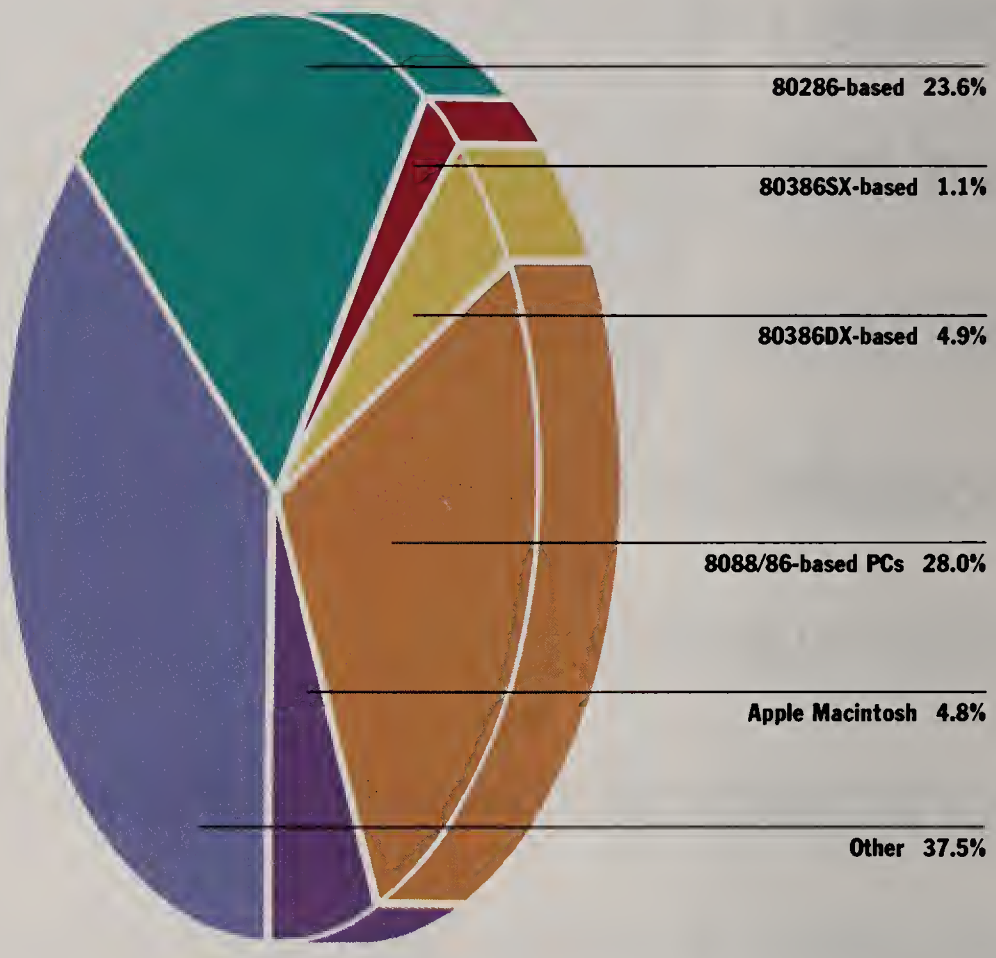
standards list and maintaining central purchasing control. Gilbane, which has about 400 stand-alone PCs and one local-area network, relies on a de facto standards list that grew out of an inventory list. "To create a sense of order and not allow chaos, we found it necessary to formalize [the list] and create a process for people to justify new standards," Winston said. When users are able to get the required financial approval for a non-standard machine, Gilbane will purchase the machine but will not provide maintenance and support services.

Support and maintenance concerns are at the center of United Parcel Services' personal computing strategy. The company, which replaced 93 IBM 8100 minicomputers with some 5,000 personal computers on over 300 local-area networks, leverages the fact that it is in the package transportation business to maintain a large central support facility at its private airline hub in Louisville, Ky. The company configures and repairs all of its PCs in Louisville and can guarantee a 24-hour turnaround on requests from users anywhere in the world.

Steven Heit, information services planning manager for UPS in Paramus, N.J., ranked the ability to provide central service and support as the company's top concern "because UPS is a global company with a number of remote sites. So, we really try not to have 30 different types of PCs, and we limit our suppliers to as few vendors as possible."

UPS, which expects the need for multitasking to grow in the future, is standardizing on the '386 "to minimize service complications."

1989 U.S. PC Installed Base



TOTAL = 50.74 MILLION UNITS

SOURCE: INTERNATIONAL DATA CORP., 1990

It relies on three vendors to supply its PCs: NEC, AT&T and IBM. "We don't have to negotiate service contracts; but all three were willing to work with us and our technicians to enable us to become our own service provider," Heit said.

The challenges presented by personal computers have evolved almost as much as the technology has. Managing and integrating the machines dispersed across a company demands several layers of decisions and far more foresight than was ever demanded by a company's mainframe strategy. Given the choice, however, most CIOs would no more scrap their PCs than they would their 3270s. "They all say, 'PCs are part of my way of life,' " noted United Research's Walker. What's more, he added, now that PCs are here to stay, most CIOs claim that "coping with them is a pleasure compared to some of the problems [they had to deal with] before." CIO

Leslie Goff is a freelance writer based in New York.

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DROWNING IN DATA

The sheer volume of point-of-sale scanner data can be overwhelming to those who have to make sense of it. The trick is to distill that flood of numbers into competitive wisdom.

In the beginning were the scanner, the bar code and the supermarket. And it didn't take a genius to figure out that if you could learn what brand-name products people were buying in what places and at what times, you could make much more informed decisions about pricing, promotion and placement of those products. Almost overnight, enough point-of-sale data to choke a zillion marketing executives was loosed upon the land. A veritable tidal wave of data. And it's not getting any smaller.

While the art of data collection is now straightforward and well-established, the arts of manipulating and analyzing that data remain both complicated and underdeveloped by comparison. Until recently, the hunger for scanner data has mainly been confined to the marketing departments of consumer-goods manufacturers, where users are relatively adept at data analysis. But the gap in capability between scanner-data collection and the task of refining it into wisdom is now being felt all the more acutely as the hunger grows beyond marketing departments and into business functions whose users need more powerful analytic software tools.

For the last three or four years, major packaged-goods manufacturers—particularly food companies—have been wrestling with the information overload caused by scanners. Today's universal product code (UPC) scanners provide 100 to 1,000 times more product sales data than was available just a few years ago, according to Information Resources

BY TAMMI HARBERT

ILLUSTRATION BY HAL MAYFORTH

Hal Mayforth

Take away his writing
his music and he
country doctor. In his

Add up the parts of Albert Schweitzer's life and you'd think you were talking about an army of men.

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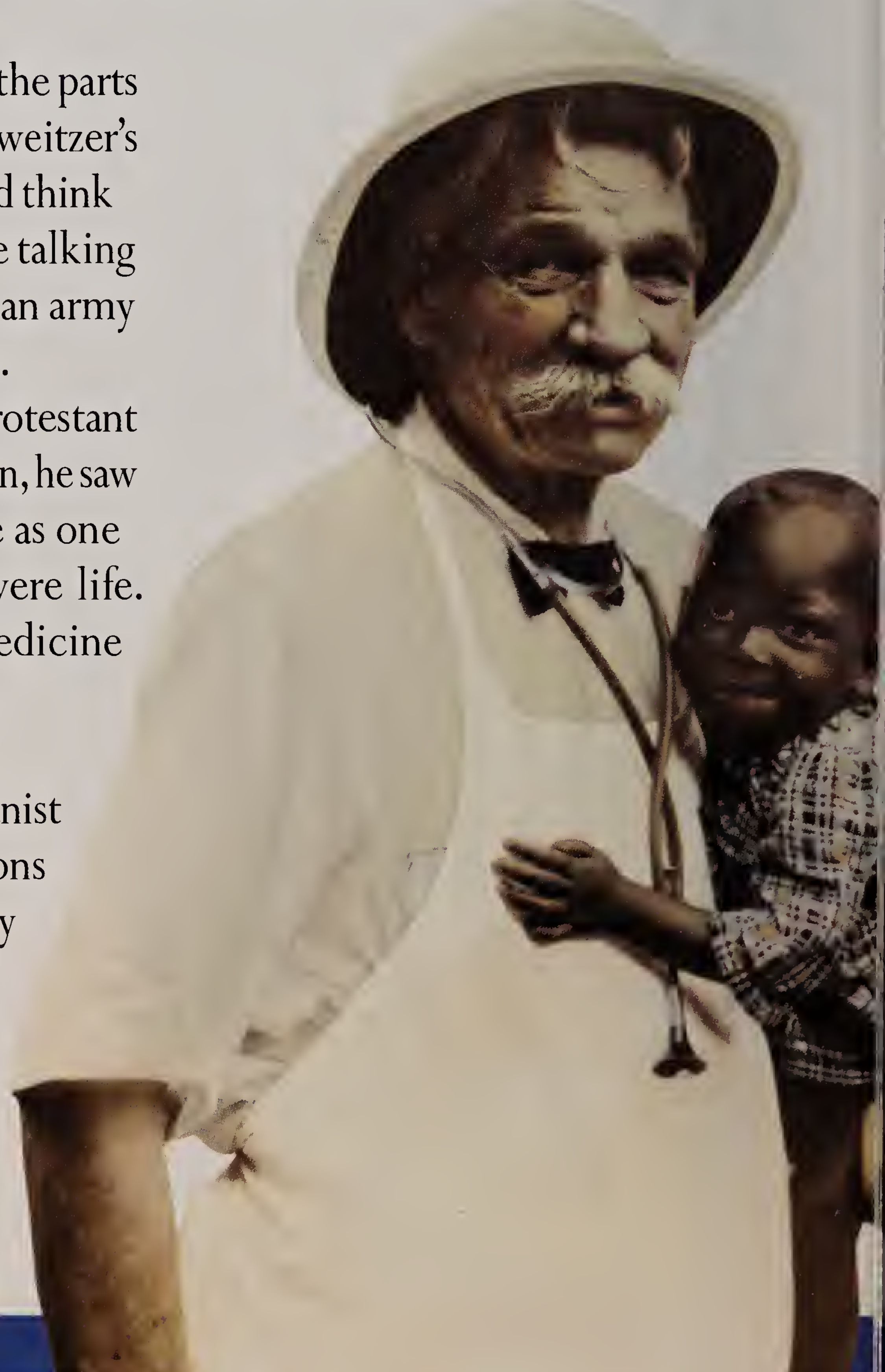

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Telecommunications *Information Services* *Mobile Communications*

, his philosophy, and
was just another
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and used the royalties to purchase medical supplies.

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Scanners are fueling the creation of enormous databases with as many as 10 billion pieces of data, updated as frequently as weekly with up to 50 million new entries.

Inc. (IRI), of Chicago, a vendor of syndicated data. This scanner data is purchased from supermarket and pharmacy chains and resold to packaged-goods manufacturers. This makes for enormous databases with as many as 10 billion pieces of data, updated as frequently as weekly with up to 50 million new entries.

The challenge is to refine this data and share it throughout the company in a form that will enable better business decision-making.

Studies conducted by Temple, Barker & Sloane Inc., a consulting firm in Lexington, Mass., indicate that scanner data users are frustrated with this deluge of data. "There is an underlying sort of guilt that they should be getting more out of it" than they are, said Timothy A. Davidson, a principal at TB&S and director of the study. Among the biggest problems cited was a lack of staff and time to analyze the data. Marketing analysts find it difficult to wade through the mountains of data that scanners generate and to identify the significant information, Davidson said. As a result, companies are increasingly turning to automated analysis software to help them form this surfeit of data into an effective tool for marketers and others in the organization. This software helps make sense of the data, highlighting trends and exceptions in it, and produces reports that are sensible to a particular end user.

Traditionally, companies have used scanner data in three ways, according to Jeffrey P. Stamen, president of IRI's Decision Support Systems Division in Waltham, Mass. They have used it to track product sales, market share and distribution; to identify trouble spots in the market and opportunities for growth; and to document trends in the marketplace and point to possible factors driving those trends.

Swift-Eckrich Inc., a packaged-meat producer based in Downers Grove, Ill., has so far been a traditional user of scanner data. For Swift, the chief benefit of scanner data has been "more-informed promotional pricing decisions," said Randy Irion, director of marketing services and research at the company. Although he wouldn't quote an exact figure, Irion estimated that the higher quality of these decisions has saved the company millions of dollars.

But Swift-Eckrich and many other companies are eager to make broader use of scanner data and are trying to move it out of the marketing department and put it to use throughout the company. Companies have learned how to get their arms around the data enough to understand what's happening in the marketplace, according to John H. Costello, president of Nielsen Marketing Research U.S.A. in Northbrook, Ill. Now the challenge is to share the wealth.

According to Nancy Deyo, director of market development for Metaphor Computer Systems, a data-interpretation systems vendor based in Mountain View, Calif., the sales and finance departments are the first likely candidates (after marketing) to make profitable use of scanner-data analysis tools.

Consider the sales force. With more than a million products competing for shelf space in a grocery store that typically carries 20,000 to 30,000 items, the ability of a salesperson to show a retailer how stocking a particular product will produce a higher profit for the store is strong ammunition in making a sale, noted Stamen.

To that end, Pillsbury Brands, a division of the Grand Metropolitan Food Sector in Minneapolis, has armed 350 salespeople with laptops and software that enable them to generate reports on relative brand performance to show to merchandising executives at the major retail chains. The salespeople use customized software along with a standard program from Metaphor to generate capsule reports based on the latest scanner data, according to David Gillman, director of sales operations at Pillsbury. Such data can be used, for example, to contrast performance of a product in one position on the shelf versus another position. Pillsbury views this project, which began in May, as a way to boost not only its own sales, but the retailer's as well.

In fact, according to Nielsen's Costello, scanner data can play an essential part in forging stronger partnerships between manufacturers and retailers. Some manufacturers, he added, even develop marketing programs for specific retail chains or in targeted regions.

But such efforts require increasingly detailed information from the syndicated data suppliers. In the past, Nielsen and IRI have sold data on the national market as well as data broken down into 50 regional scan markets, according to Deyo. But now their customers are pushing to have those broken down even further—into account-level markets. So, for example, a salesperson can look at the actual volumes for a given brand at a particular store in a particular chain.

Such detailed information by region and by brand will allow manufacturers such as Pillsbury to customize marketing programs to the demographics of particular regions, according to Stamen. Different regions not only have different product preferences, he said; they also have different competitors. Because of the increasing level of detail in the raw data provided, there is a growing requirement that the data be accurate and reliable (see related story).

The next step in the Pillsbury program, said Gillman, is to add a finer level of detail to the reporting capability. The company would like to be able to generate reports that break out sales not only by brand categories, as they do now, but also by individual product types. This is the difference between seeing all sales for Brand X dishwashing liquid versus seeing sales for the various sizes in which Brand X is sold.

Ken Kranz, manager of marketing analysis and scanning development at Nestlé Foods Corp. in Purchase, N.Y., refers to this capability as "peeling the data right down to the account level." Kranz, who formerly worked for Nielsen, was hired by Nestlé three years ago to help the company develop ways to use scanner data. Kranz currently receives national figures and figures broken down by the 50 scan markets. Like others, he would like to have the information further broken down into regional markets and, ultimately, down to the key-account level, he said. The ideal situation would be for a salesperson in Atlanta, for example, to look at the performance of the Nestlé product mix at the Kroeger supermarket chain.

Like Pillsbury, Nestlé is planning to take scanner data beyond the marketing group. The next target is the finance department, said Kranz. When he started at the company three years ago, he explained, he tried to interest the finance department in using scanner data, but got nowhere. Recently, however, the department has begun to show some interest—spurred in part, said Kranz, by articles the finance people had seen in the business press.

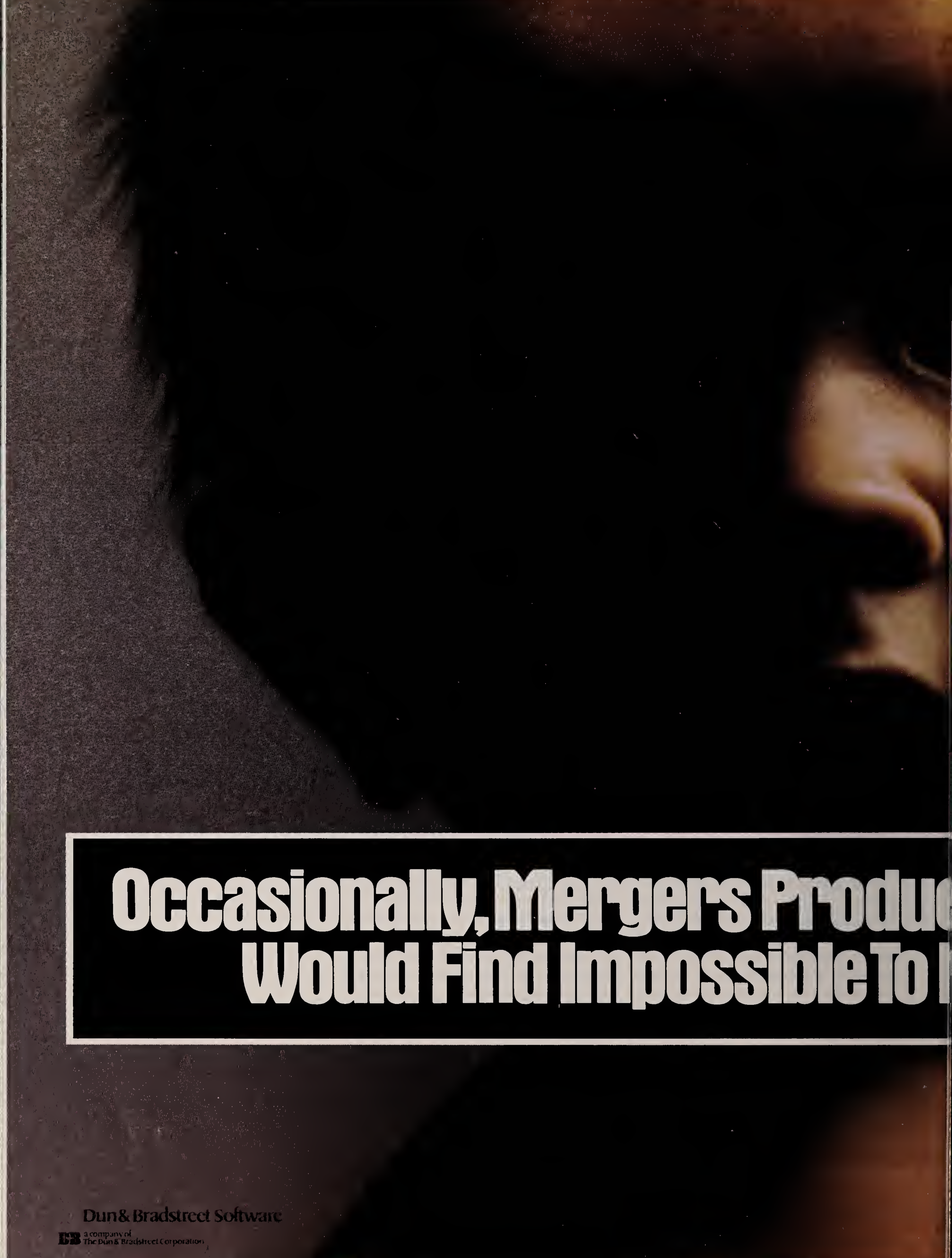
While sales and marketing use the data to track the effect of marketing programs on sales, a finance department can help determine whether these expenditures are cost-effective. Metaphor's Deyo noted that finance departments can use the scanner data to compare the costs of producing and distributing various products against their prices and sales levels. They can use this information to analyze brand-by-brand profitability and forecast profits for budgeting purposes.

Companies are increasingly reluctant to rely on "gut feel" marketing and more intent on using hard statistics in order to justify their marketing expenditures, Deyo said. Costello calls this trend "pay-back marketing," and defines it as focusing on getting a better return-on-investment from marketing expenditures so that the goals of higher sales and market share can be achieved in the most cost-effective way.

This increasingly critical use of scanner information means it must be focused and analyzed properly—which is precisely what companies

Consumers of the data experience "an underlying sort of guilt that they should be getting more out of it than they are."

–Timothy A. Davidson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Companies are increasingly reluctant to rely on a "gut feel" approach to marketing and are more intent on using hard statistics in order to justify their marketing expenditures.

Making the Grade

As manufacturers become increasingly interested in applying detailed scanner data to business decisions, data vendors are coming under increasing pressure to improve the accuracy of their products

"Overall, I think manufacturers are really frustrated with data integrity," said Nancy Deyo, director of market development for Metaphor Computer Systems in Mountain View, Calif. Although surveys conducted by Temple, Barker & Sloane Inc., a consulting firm in Lexington, Mass., find that users are more satisfied with accuracy than they used to be, "there is a continual undercurrent of pressure from manufacturers to get data suppliers to be more accurate," said Timothy A. Davidson, director of the surveys.

When asked how accurate the data is, users don't exactly give ringing endorsements. "Nothing has hurt us," said Ken Kranz, manager of marketing analysis and scanning developments at Nestlé Foods Corp. in Purchase, N.Y. But he pointed out that Nestlé's use of the data doesn't depend on accurate accounts of market share—chiefly because Nestlé is the leader in many of its markets and is more interested in driving overall sales than in gaining market share over its competitors in a category.

SAMI Arbitron, of New York, the third most commonly used data supplier in the TB&S surveys, is addressing the reliability problem by developing a product that will be more accurate than other syndicated data services, according to Mike Wolfe, director of product planning. The product, called CensusScan, has been in test use for a year. When released commercially in three markets later this year, CensusScan will poll the entire market rather than take a statistical sample approach. Instead of basing its reports on a sample of 15 percent of the participating stores in a given area, for example, SAMI's reports will be based on data from all of the stores that participate.

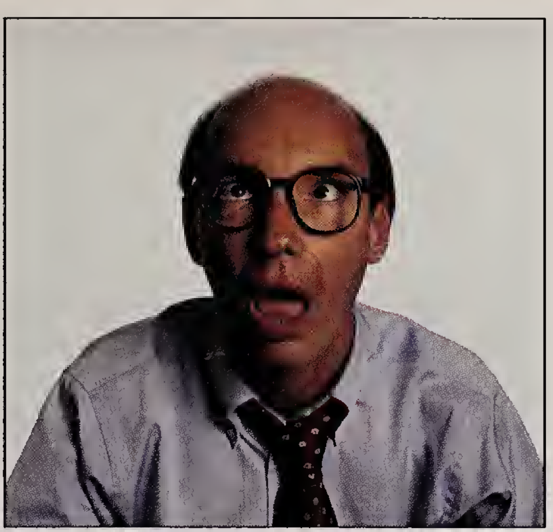
For example, said Wolfe, in a recent study of soft-drink sales in the Los Angeles market, a comparison between syndicated data based on sampling and data based on SAMI's CensusScan showed an undercount of 2.5 share points in the sampled data—which in the soft drink market translates into tens or even hundreds of millions of dollars. The reason for the difference? Upon examination, SAMI found that the statistical samples on which the data were based did not adequately represent stores in Hispanic areas, where sales of this particular brand were high. Because SAMI counted all the stores, it presented a fuller picture.

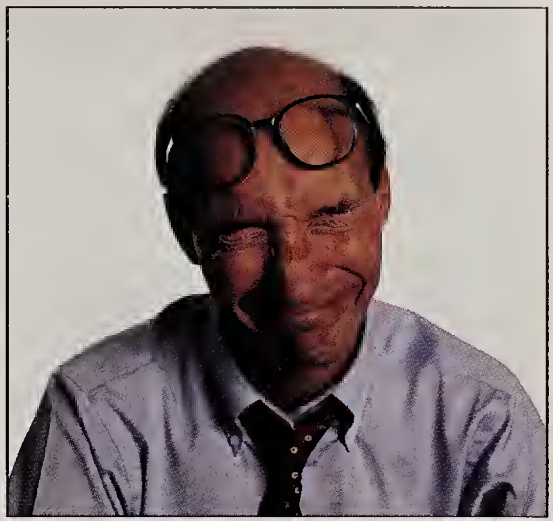
John H. Costello, president of Nielsen Marketing Research U.S.A., the leading data syndicator, defends the accuracy of his company's samples, which are drawn from more than 3,000 stores in the United States. The company says it works with U.S. Census numbers and employs nationally recognized statistical experts to make sure it is getting a high-quality sample. Costello also stressed that the company works closely with users to ensure that the data accurately reflects users' own shipment information.

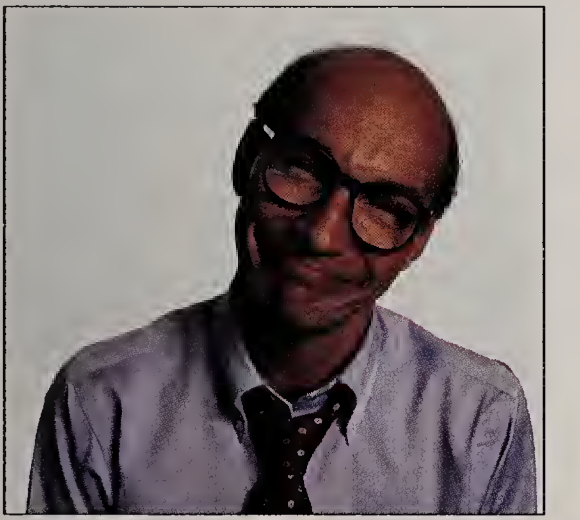
But Wolfe believes that the CensusScan product is aimed directly at the most important need of users. "They are only concerned with information quality in as much as it affects the quality of their decisions," he said. "You have to have quality information to make quality decisions."

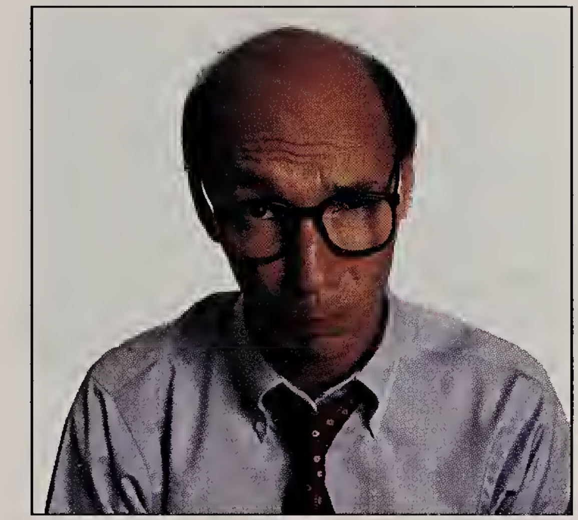
—*T. Harbert*

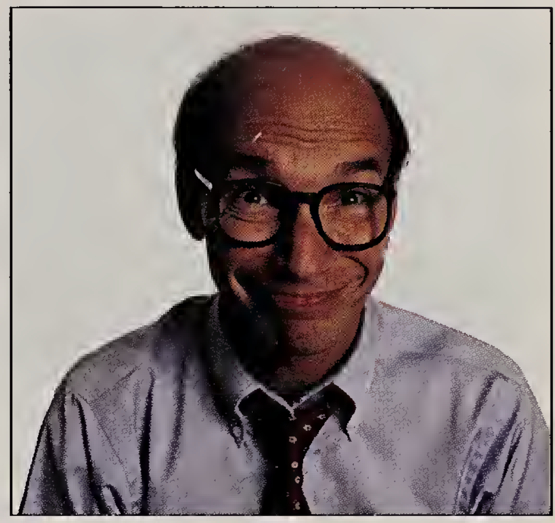
"Hello Mike? What does hard disk failure mean anyway?"


"Mike, we're spending a fortune on these PCs–where is all this money going?!!"

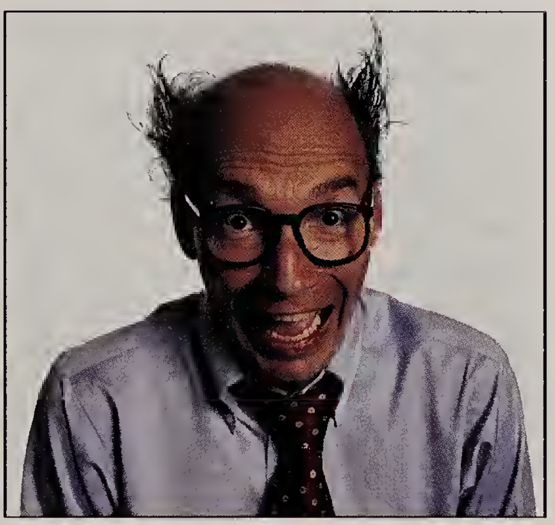

"Hi Mike, can you help me? I can't get on the network."

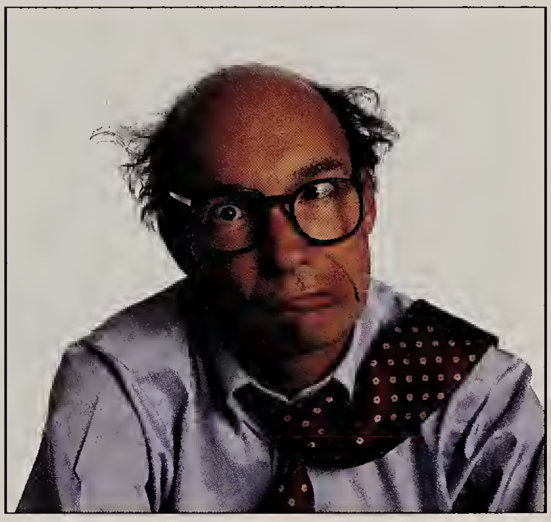

"I have some questions about this DOS stuff. Gotta minute?"


"Quick Mike, I desperately need a color monitor for a big presentation to our CEO!!"


"Hello Mike, sorry, I forgot my password. Again."

"How come they got it and we didn't get it, huh Mike? What's the deal?"


"Mike, I'd like a summary of exactly what you and your people do all day on my desk by noon tomorrow."


"Yo Mike, there's some smoke coming out of the side and this big, loud buzzer noise...Mike? Hello, Mike?!"

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Since packaged-goods manufacturers can all buy the same scanner data, the benefits will come from how they use it. The key will be to build custom applications.

have the most trouble doing. That's why the most valuable element in a company's scanner-data strategy could be automated analysis software. Such software is "a marketing analyst in a can," said Davidson. It essentially does three things: identifies and reports exceptions (new, unusual or unexpected trends) buried in the scanner data, points out possible causes for the exceptions, and produces a report suitable for the end user—be it a marketing person, a salesperson or a finance officer. The vendors of syndicated data, as well as some third-party software suppliers, are currently developing such products.

Of the 51 companies surveyed in the latest TB&S study in 1989, 45 percent used a computer pre-screening program to highlight market trends and focus analytical efforts. About 86 percent of the respondents expressed interest in using some sort of automated analysis, and about half had tested or seen a demonstration of such a program.

Building custom applications that use scanner data is the key to using such data for competitive advantage, said Steven Rubinow, director of Decision Support Services at The Quaker Oats Co. in Chicago. Since packaged-goods manufacturers can all buy the same scanner data, the benefits will come from how they use it. For example, at Quaker Oats, Rubinow has built software models by category and even by brand that can forecast sales under various conditions. In addition, he said, "we do something the data vendors can't do: We integrate the scanner data with our own information." While scanner data can tell anyone whether Quaker is selling more or less oatmeal, Quaker is the only one who knows whether it is making more or less money on those sales.

Such software is such a valuable tool that these models are closely guarded secrets at some companies. Kranz, for example, won't give details on a "promotion evaluation model" he developed at Nestlé, because the company is in the process of copyrighting it, he said.

In addition to more detailed regional and account-level information, users are also asking for more complete information on consumer spending patterns. This so-called "single-source" information is typically gathered in addition to scanner data but sold integrated with it. Such single-source data would take into account every factor driving a sale: TV ads, print ads, coupons, price, store displays, etc.

"There are lots of things you can't get from scanner data," said IRI's Stamen. IRI supplements the information gleaned from scanners with data supplied by a panel of consumers, who are asked by the syndicated data suppliers to record their purchases. As an example of the value of panel data, Stamen cited the case of a liquid hand-soap in a dispenser. When the product hit the market, scanner data showed sales skyrocketing, with no sign of an end in sight. But panel data revealed that many customers were trying it once or twice, but then going back to their old soap. The panel data enabled a more accurate prediction of sales leveling off in the future.

Users say such data will help them get a more complete picture of their markets. This in turn will help them make more intelligent business decisions. The payback from the effective use of this information can be enormous, but it is difficult to quantify. Nestlé's Kranz cautioned that the payback is not immediate and sometimes not even obvious. Although he cites the fact that the company has improved its promotion efficiency on at least two product categories by around 25 percent over the last two years, he believes there are even more important benefits. "I don't think you want to be so shortsighted as to just look at the short-term financials," he said. Scanner data is helping to improve Nestlé's relations with retailers, the company's brand image, and consumer service and relations.

Tammi Harbert is a Boston-based freelance journalist specializing in computers and electronics.

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Smaller Is Bigger

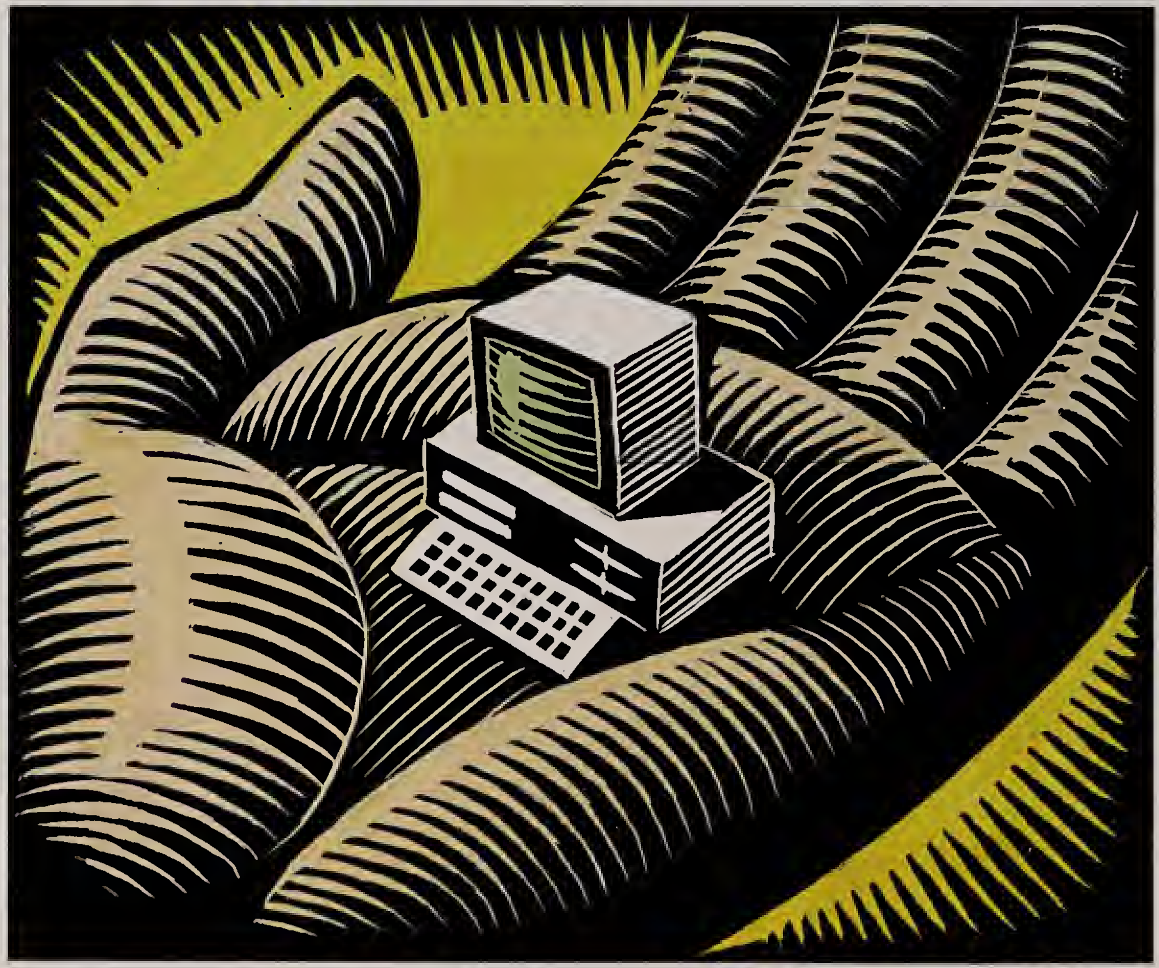
How do you fit a dozen mainframes onto the corner of a desk? By making dramatic improvements in microprocessor technology.

BY PATRICK GELSINGER

In less than 10 years, the personal computer has revolutionized information processing. The rise of the PC has been driven by exponential improvements in semiconductor technology.

Since the integrated circuit (IC) was invented in 1959, the number of transistors embedded onto a single IC has increased at over 50 percent per year. One application of IC technology has had particular relevance to information processing: the microprocessor, which is a central processing unit (CPU) on a single chip and the key component of personal computers. The first IBM personal computer was based around the Intel 8088 with almost 20,000 transistors. By the introduction of Intel's i486 in 1989, this number grew to 1.2 million transistors.

This increasing transistor budget has allowed microprocessors to yield dramatic improvements in computational power. The 4004 of 1971 operated at 60,000 instructions per second. The i486 CPU of 1989 operates at 15 million instructions per second. That's a 54 percent improvement per year.



Compare this increase to annual performance improvements of 20 percent for mainframes and 30 percent for minicomputers. In 1988, microprocessor-based computers surpassed minicomputer performance. As a result of this crossover, the entire minicomputer industry is in the midst of a significant restructuring, and the new minicomputers will employ microprocessors as the core technology.

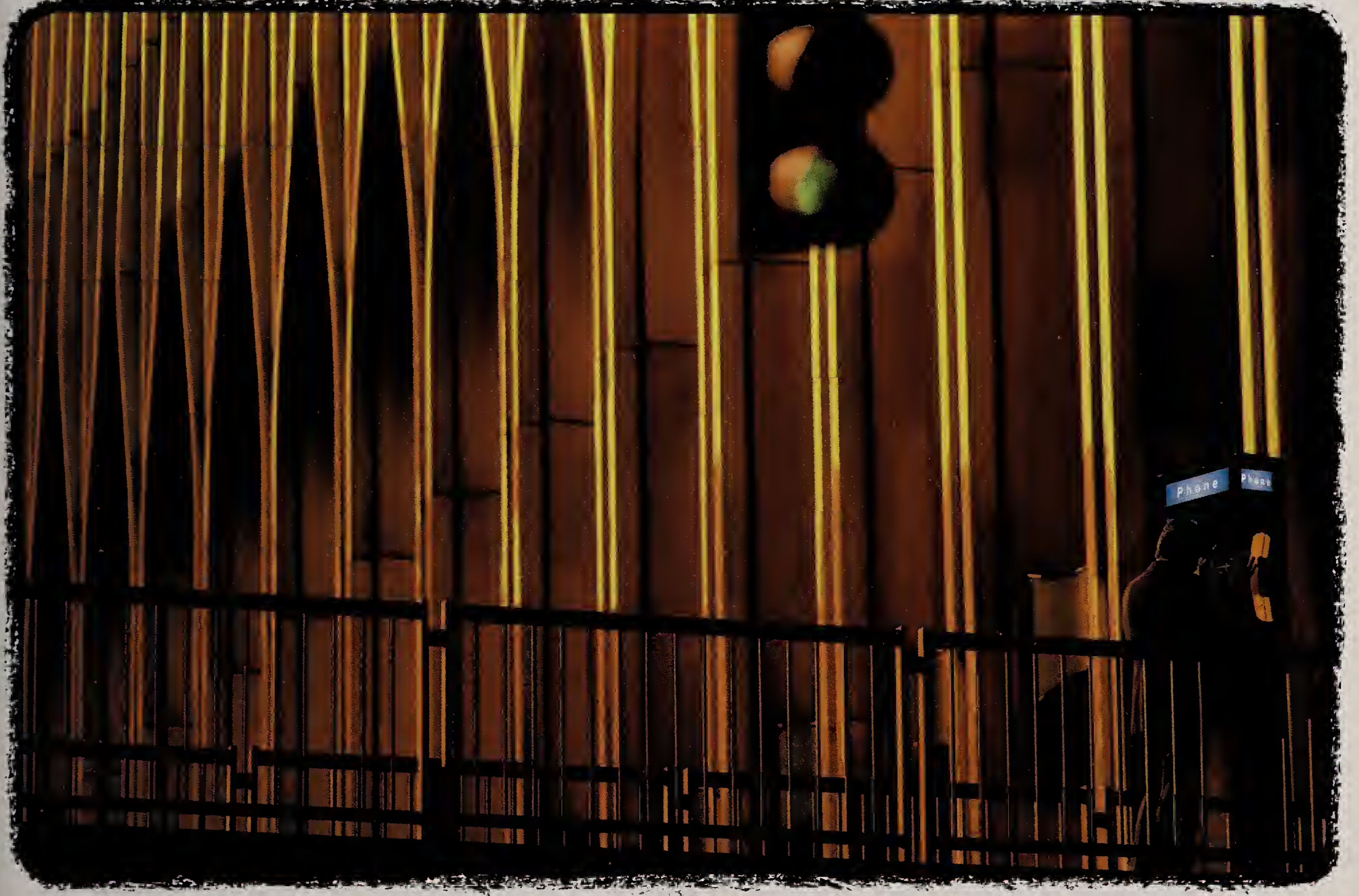
Over the next decade, it is expected that a single integrated circuit will contain over 100 million transistors. Microprocessors will be capable of performing over 2 billion instructions per second, and personal computers using these microprocessors will routinely contain 128 megabytes of RAM and a one-gigabyte disk drive.

Fulfilling these projections will certainly be a challenge for semiconductor companies. To pack the 100 million transistors noted above will require a die that is one inch by one inch with the smallest individual geometries at about .2 microns. Today's largest chips are about .55 inches square with the smallest geometry at about one micron.

One of the most important process technologies in semiconductors is the lithography process. This is similar to a miniature photo being developed on a silicon wafer. It is believed that the ultraviolet-light process currently used can be pushed into deeper and deeper UV ranges with respectively shorter wavelengths. If this should fail, however, X-ray and electron-beam lithography are both being used with success in specialized areas.

ILLUSTRATION BY CHRIS GALL

It's the rest of your phone system.



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These two approaches can create geometries with dimensions below .1 micron. While packing so many transistors onto a single silicon surface is challenging enough, the transistors need to be connected to each other to create interesting functions. To do so will require more levels of metal interconnect than is currently used. By the year 2000, certainly four and possibly five levels will be used. This is like a superhighway network five levels high built above a housing complex.

To manufacture such a device will require substantial improvements in clean-room technology. Currently, microprocessors are manufactured in rooms with about one particle of foreign matter per cubic foot of air. By comparison, the air around you has about 30,000 particles per cubic foot. (You never knew how filthy dirty you were, did you!) It is expected that to manufacture devices like these will require levels of only .1 and possibly .01 particle per cubic foot of air.

Many technology improvements are required to achieve 100 million transistors on a single chip. However, the bulk of these technologies have been demonstrated in various research facilities or are evolutions of technologies currently in use. No fundamental roadblocks exist to achieving these projections.

The significance of this rate of improvement can't be underestimated. Had your car's fuel-efficiency improved at this rate over the same 31-year life of the integrated circuit, you would have a lifetime supply of gas on your first fill up! A single PC of the year 2000 will possess more computational power than a dozen of today's largest mainframes populating your computer rooms. Yes, a dozen mainframes compressed into a single corner of your desk, still leaving room for photos of your family.

Today's PCs contain 2 million to 10 million transistors. The 100 million transistors of future PCs will provide plenty of room to include new functionalities. By the year 2000, the smallest calculators will be capable of all the functionality of today's PCs. Computerized appointment books/work planners and hand-held and palm-top computers will contain incredible capabilities. It will be possible to have a pocket-size calculator holding a complete 10,000-volume library that can be searched for any piece of information in a fraction of a second.

It will be commonplace for these pocket machines to include a radio-frequency network connection. Wherever you go, you will be attached to the network. While sitting in the middle of a meeting, you can get an update to your calendar from your secretary (your next meeting is in the same building—you don't need to drive back to the office), or receive a message (either electronically mailed or speech-recognized and forwarded electronically) and send a reply without ever interrupting the meeting.

Had your car's fuel-efficiency improved at this rate over the same 31-year life of the integrated circuit, you would have a lifetime supply of gas on your first fill up!

With such dramatic computational power, the potential applications will be daunting. Making 10-year application projections is a risky business at best, but there are a few application areas where the predictions seem quite likely to come about. First, the human interface of the computer will be dramatically improved. Speech-recognition will be commonplace. Your computer will be able to take dictation and respond to voice commands with ease. Current research has demonstrated an adaptive speaker, continuous-speech-recognition system that learns the speaker's voice as he or she talks (adjusting its word-recognition as the speaker corrects its mistakes) and requires no artificial pauses on the speaker's part. The system runs in real time on an i486 running at 33 Mhz. By 1995, the average desktop PC will contain at least this level of performance.

Stylus input and audio and motion-video output will augment today's primarily text and graphics displays. Users will be able to scribble comments via stylus on the edge of an electronic memo much as they do on paper memos today. Motion and still video pictures will be commonplace on PCs. The video production capabilities exclusive to a few motion-picture laboratories today will be on every secretary's desk to prepare every speech and presentation that is given. Both stylus and motion-video capabilities are now in early market products. Speech-recognition will be augmented with some basic natural-language processing. Thus, users won't converse with computers in obscure commands and mouse operations as they do today, but rather in more natural words and phrases.

It is unlikely that natural-language recognition will be very broad, but a limited dialect will make computers far more intuitive than they are today. The users of such computers will include every member of a company, the barrier to use will be dramatically lower, and the productivity and quality improvements will be so high that no one would consider working in any other way. It will seem as compelling as using a telephone or television set.

Another potential application that seems fairly certain to come about within the next 10 years is in the area of scanning and image-recognition. The longtime dream of a paperless office will finally become a reality; when paper is received, users will immediately scan it into their systems rather than deal with cluttered file cabinets. Documents will be permanent and far more accessible when in computerized format.

Furthermore, networks delivering data to the computational power at the desktop will allow information processing unimaginable today. Fiber networks will certainly be common. And reconfigured network topologies will give users more effective bandwidth than they receive today.

The information storage capabilities will be equally stunning. Information cards the size of a credit card will contain complete multi-thousand-volume libraries of information. For instance, one card could contain the last five years of a company's sales information. Given the computational power described above, searches for information will occur instantaneously over many of these massive libraries.

With this amount of computational power and storage, personal computers will have a dramatic impact on information processing. The PC's capabilities will transform it into the personal information system of the year 2000. The cost advantages will be so compelling that large databases will migrate onto networks of PCs. Several major corporations have already taken this step, moving such critical databases as corporate ledger from their mainframes to PCs.

In light of the intense demands for data security of large databases, this migration may seem risky. However, microprocessors currently under development—and all subsequent generations—will have the required data integrity and reliability support.

The miniaturization of computers through advances in IC technology will result in additional reliability, and the dramatic cost-performance savings of microprocessors will allow redundancy techniques to be employed. While redundancy is practiced on some highly reliable mainframes today, the cost is too prohibitive for it to be used extensively. But in the future, even the most sensitive databases will be able to migrate to PCs and networks of PCs, providing hundredfold savings in applications.

As has been the case since the personal computer was first introduced, these improvements in performance have been and will continue to be upwardly compatible. Thus, investments in personal computing software and hardware will be preserved as microprocessor technology evolves forward. While it's a given that each day's computer dollar buys more than the previous day's, there are no radical departures on the horizon that will force users to discard their current and ongoing investments in microprocessor-based computers. Even where there are significant breakthroughs, such as with the use of graphical user interfaces (GUI), compatibility is maintained as the new technology is embraced.

When Intel invented the microprocessor years ago, founder and CEO Gordon Moore spent an evening wandering about his home trying to imagine every way this new gadget might be used. He cheerfully recalls that he was wrong on several guesses and that he didn't imagine many others. I'm sure the 10-year projections contained herein are fraught with errors as well. However, the significant impact of microprocessor technology upon information processing and management is certain.

Patrick Gelsinger is director of the Platform Architecture Group of Intel Corp. in Santa Clara, Calif. He headed Intel's i486 and i386 microprocessor design teams.

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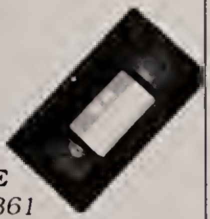

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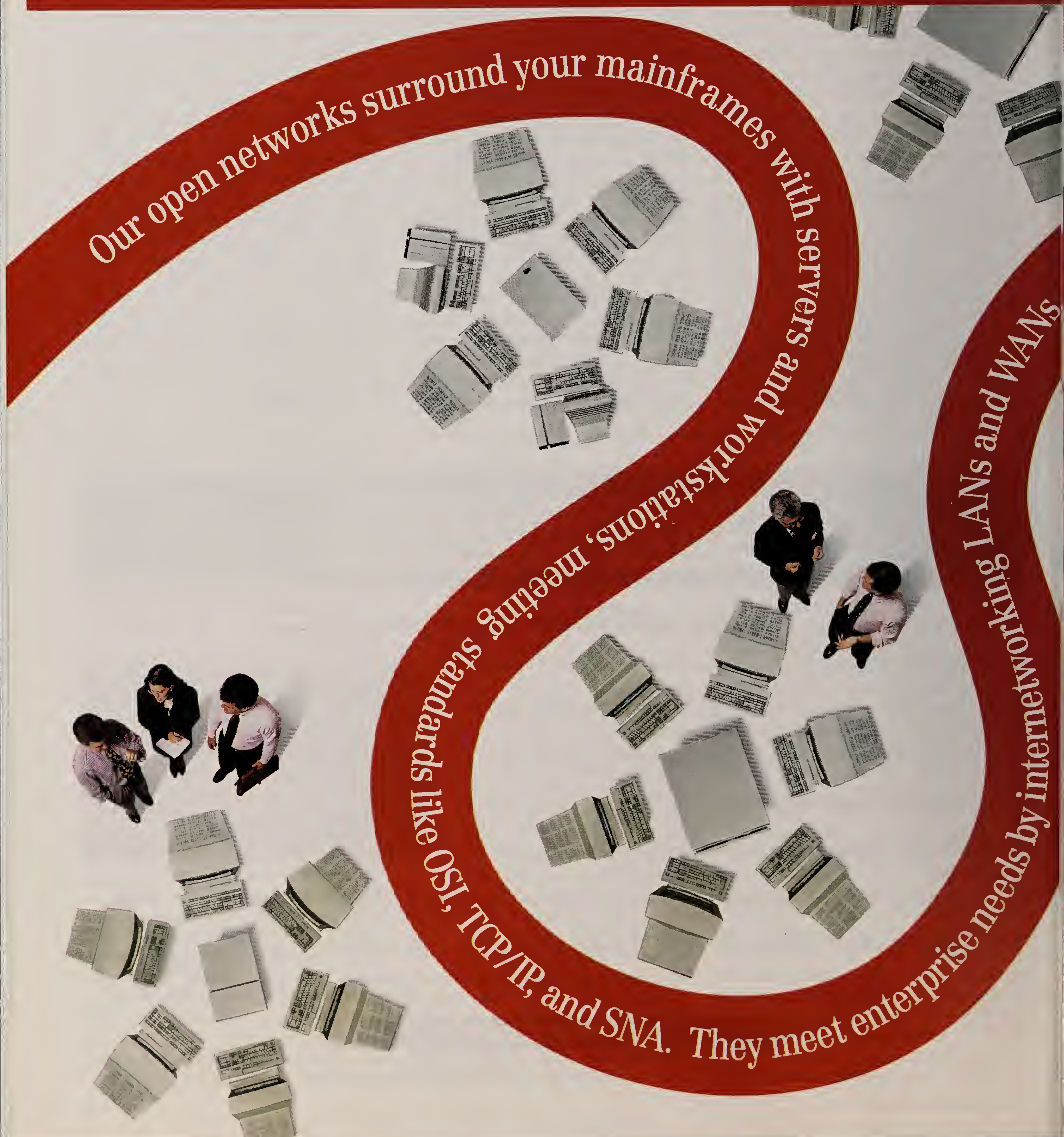

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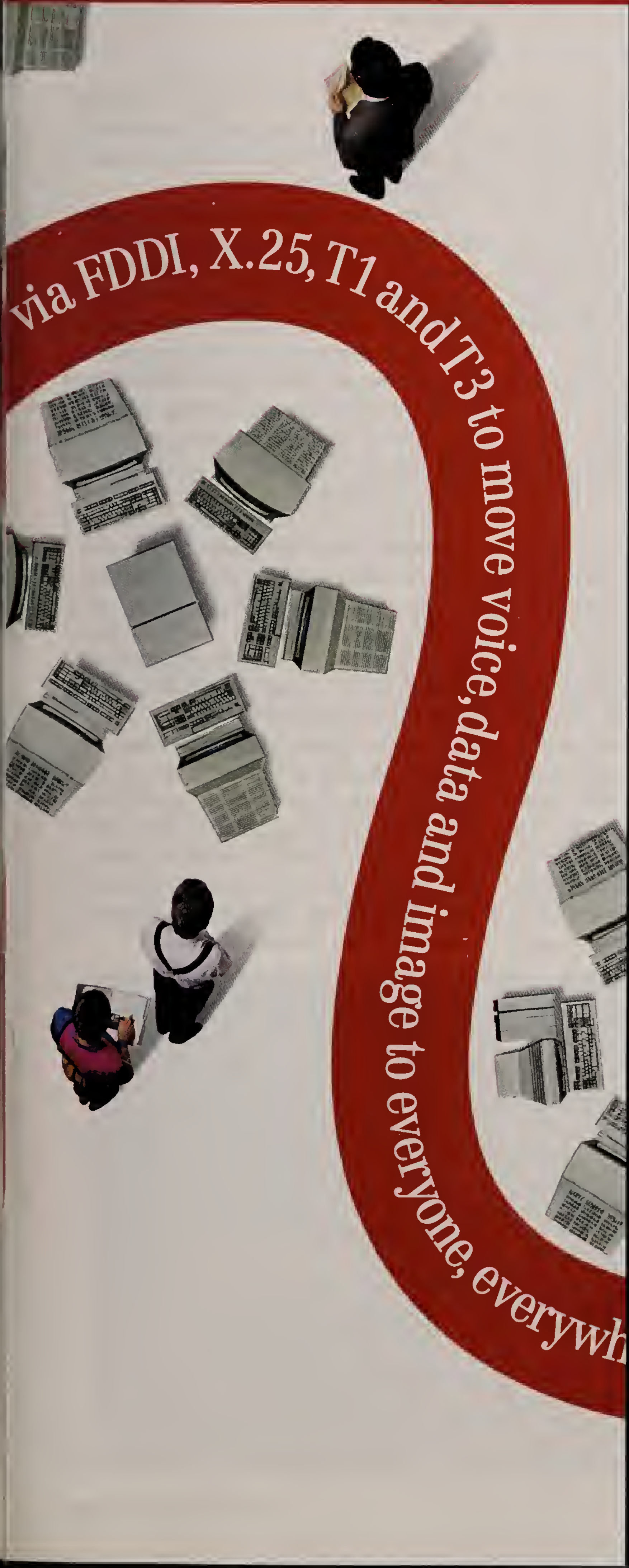
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Making Change

A CIO must play many roles in helping to plan and manage organizational change

BY CHUCK CALLAN

After grappling for five years with the enormous technical complexities of developing a massive, multimillion-dollar computer system, the IS department of a major financial-services company thought it was finally seeing some light at the end of the tunnel. With millions of lines of code complete, the installation plan was on track and implementation was underway.

Time to celebrate, the chief information officer thought. Little did he know that his troubles were just about to begin.

In order to reap the financial benefits made possible by the new system, the company had to undergo a major reorganization. Functional departments would be regrouped by market segments—for instance, one group would be organized around the company's major national accounts. This group would contain all of the elements necessary for effectively doing business with those accounts, including operational and administrative support as well as sales and marketing and bottom-line accountability. As a result, former department heads would get new bosses, and the old incentive system, which rewarded managers of large departments, would be discarded.

Faced with these changes to their established way of doing things, the assassins came out of the woodwork. Customers and regulators were drawn into the concerns of the assassins, and management felt compelled to mandate an audit. The information systems organization, having invested years of effort in the new system, now faced the prospect of it being scrapped altogether.

This is a not-unfamiliar scenario. Computer and communications technology often causes radical changes in the way a business operates, affecting the methods by which orders are filled, products are developed and manufactured, sales are made, and goods are distributed.

In turn, these changes in business processes alter people's sense of security, their roles in the organization, and their reporting relationships. We often hear a senior business executive remark angrily about an IS project, "I asked for customer information, not a new way to sell our product."

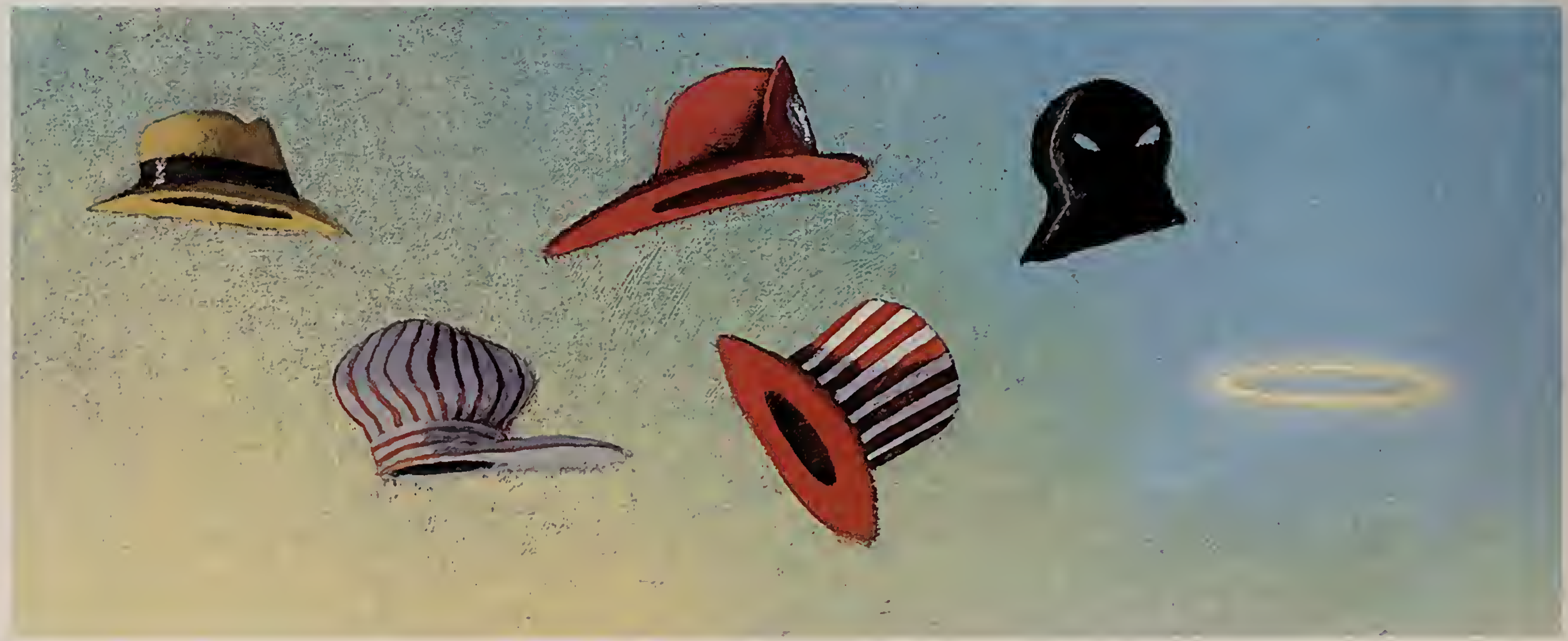

ILLUSTRATION BY KEVIN HAWKES

TEXAS
INSTRUMENTS

"I usually got what I asked for...but never what I needed."

Dear CIO reader:

The words are Jerry Junkins'. The occasion was a recent press conference for Texas Instruments' CASE product, the Information Engineering Facility^{TM} (IEF^{TM}).

Jerry, who is TI's CEO, was reminiscing about the many information systems he worked with in years past—as a user—and commenting on the difficulty he had in working closely with developers to build successful applications.

Our customers have been very successful with the IEF. Gartner Group did a CASE study last August and learned, for example, that IEF developers had achieved maintenance productivity gains of up to 10-to-1. And they reported zero defects in IEF-generated code—not one abend had occurred.

But what Jerry was saying was that the biggest payback from the IEF—bigger than 10-to-1 productivity gains and bigger than zero-defects source code—may well be the improved communication it fosters between systems developer and business user.

With the IEF, your systems can be planned, demonstrated, perfected, and maintained using only diagrams—diagrams which are easily understood by both developers and users. Developers can make more contributions to solve business problems, and users can see more possibilities for innovative solutions. *They can work together.*

So, just how important is this improved communication?

Productivity gains and the quality of generated code can be measured. But how do you count the cost of the system that *almost* solved the business problem?

Sincerely,

Mike Watters

Mike Watters
Vice President and General Manager
Advanced Information Management Div.
Texas Instruments Incorporated

(Note: More information on the IEF may be found on the following page and on pages 6 and 7.)

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An IEF™ Technology Q & A

with Dennis Minium

Dennis Minium is Director of Technology and Methodology for Texas Instruments CASE product, the Information Engineering Facility™ (IEF™).

Q. Can the IEF actually create an executing application from a specification recorded as diagrams?
A. Sure. By building the appropriate set of diagrams on an IEF workstation, you can develop a complete system specification. You can use the IEF's rule-based consistency checker to ensure that the specification is complete and consistent. When you're happy with the specification, you ask the IEF to construct the system. The IEF will then generate all necessary source code (in either COBOL or C, your choice) and database definitions, invoke the appropriate DBMS facilities to install the databases, invoke the appropriate compiler to compile the programs, and invoke the link and bind facilities.

When the IEF is through constructing, the application, specified using only diagrams, is ready to execute.

Q. How much modification to the generated COBOL or C is required before the system can execute?
A. None. One of our principal design goals when we drafted the IEF architecture was to build a generator that would produce accurate source code. In August, Gartner Group conducted a CASE survey in which developers were asked about the abends (failures) they had experienced. Developers using the IEF reported zero defects—no abends in IEF-generated code. Of course, we simply view this absence of failure as conformance to the IEF's original design goals.

I guess that explains why I was surprised by a statement in a marketing brochure distributed by a competitor of ours. A customer is quoted as saying that 90 percent of the time the generated code was accurate. The customer was obviously pleased, but at TI we would find anything less than 100 percent distressing. To us, the IEF generator is like a COBOL compiler: you shouldn't feel the need to question its output.

Developers using the IEF rarely even *look* at the source code, let alone change it.

Q. Why does TI impose the restriction that IEF users must use Information Engineering?
A. I don't think the words "restriction" and "Information Engineering" have much to do with each other. Information Engineering is a highly flexible and adaptable development framework. You can start in planning, analysis or design. You can choose from a growing spectrum of techniques. You can choose among alternative life cycles. In fact, you can even choose between *methodologies*; for example, Ernst and Young's Navigator methodology has been used with the IEF, among others.

In short, we chose Information Engineering as the basis for the IEF because it can address a broad spectrum of needs in a large number of MIS organizations.

Q. What are TI's intentions concerning IBM's AD/Cycle?
A. We applaud the spirit of AD/Cycle and plan to conform to the AD/Cycle architecture in an IBM environment, just as we plan to conform to the Cohesion architecture in the Digital environment. Once the repository is mature enough to provide a reasonable development platform, we will provide the means for our customers to make use of it.

Likewise, we're committed to standards in general. We've announced CUA compliance for both the workstation and the mainframe in 1991. We are also supportive of IBM's SAA and Digital's NAS, and we've initiated support for generation of open systems in UNIX environments.

Q. For what environments can the IEF generate today?
A. IEF generation of production systems for CICS, IMS/DC, and TSO using DB2 databases in the IBM MVS environment is commercially available today. Now it can also generate for IBM's OS/2 with DBM, IBM's VM with SQL/DS, Digital's VMS with RDB, TI1500 UNIX with Oracle, and Fujitsu UNIX. Right now, availability of these new generators is limited, but they're all scheduled for commercial release in March, 1991.

We understand the growing need for a common specification across heterogeneous platforms found increasingly in MIS shops today.

Q. What can we expect from the IEF in the future?
A. There's an awful lot going on in the IEF R&D labs these days. We're continuing to expand the number of environments for which the IEF can generate, including a variety of other UNIX platforms and the Tandem NonStop environment. At the same time, we're working on making the IEF tools themselves run on platforms besides IBM PC's and PS/2 compatibles. We're working on a portable, distributed repository and generation of cooperative applications. Longer term, we're looking at the incorporation of object orientation into our specification language, automation of more of the development task, and automated assistance for large scale project administration.

Note: More information on the IEF may be found on the preceding page and on pages 6 and 7 .

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Many companies installing new information systems fail to realize that the systems will cause some major organizational changes within the corporation. These changes must be planned for and managed, as must the political and interpersonal issues that will inevitably arise.

With companies becoming increasingly innovative with information technology, the question these days is not so much what business processes to change but how to make the changes. More and more organizations are beginning to view technology as a "commodity" and the real business/competitive benefits as emanating from how it is put to use. The most important part about re-engineering a business process through information technology is making the change happen.

Many companies have taken the first step in addressing this problem by devoting a significant amount of senior management time to defining the vision of the business and the direction it will take in the future. Unfortunately, such "visioneering" alone will not bring about change. Old routines don't die quickly; organizational charts are tricky things to alter. Employees and middle managers don't buy into new concepts automatically—not in an era when new management fads are paraded through factories and offices seemingly every month.

It isn't that people necessarily resist change. But they do resist loss of control over their destinies—they don't know if they will succeed in the new environment, much less still be around—and they resist things they don't understand.

Most of all, people resist change that threatens their "social contract" with their employer—their beliefs about what they give to the company (effort, loyalty, commitment) in return for what they receive (pay, status, recognition, security). New computer systems can change this delicate balance, and it's up to management to restore the equilibrium.

If organizational change is left unmanaged, morale plummets, productivity wanes and people leave. At its extreme, employee resistance to change can turn to sabotage.

What is the CIO's role in managing organizational change? Is he or she the one to lead the transformation of the business? Absolutely not. Only the CEO, the president or a high-level functional executive can assume that role. No matter how good the advice, few factory managers would let an IS professional tell them how to rearrange the assembly line.

While CIOs have no formal authority over line functions and business processes, they are often in the best position to ensure that changes are managed early on in a project. They frequently have the best sense of the business as a whole, and from a cross-functional perspective. But to help manage organizational change, CIOs must understand that their role is to be a change agent.

Change agents produce conditions necessary for others to make changes happen. They set the stage and write the script. Someone else acts the part and gets the credit. Some agents are more effective than others at managing change. And different organizations and circumstances call for different types of change agents at various stages in the process of managing change.

Here are a few types of agents and their roles. Each is appropriate for a different phase of the planning process, and the CIO needs to know when he or she should play which. In some cases, the CIO should staff systems planning teams with people who can assume the various roles among them.

The Publicity and Booking Agents: I've yet to see a major new systems effort that suffers from too much up-front communication. In managing technology-driven organizational change, all employees must understand the vision of the company and the particulars of the new system.

It's nice to know where we are going—the vision and mission. It's even better if people can internalize what work will be like in the new world—that is, how they will interact with customers and each other, what the new budget process will be like, and so on.

The CEO of an industrial and consumer-products manufacturer made over 40 local site visits in a year to tell employees about a proposed information system and the likely organizational implications. In addition to describing the way business would be conducted, he listened carefully to them about what they thought it would take for the change to succeed. Managers in the IS department played an important part in staging these meetings because they understood the value of their role in selling the changes, not the functionality of the system.

Effective publicity agents also ensure that contributors to the effort and early successes get the recognition they deserve.

> *Many companies installing new information systems fail to realize that the systems will cause some major organizational changes within the corporation. These changes must be planned for and managed, as must the political and interpersonal issues that will inevitably arise.*

The Re-agent: Every organization has a maverick. These people get away with stirring things up because they are solid performers. In organizations where most people are hesitant to change the status quo, mavericks serve an extremely valuable purpose: They challenge old assump-

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tions about how business is done, whether that involves new ways to serve customers, develop products or manage employees.

While mavericks create enemies in the process, they force people to think in new paradigms. As Tom Peters argued in his book *Thriving on Chaos*, management should make an effort to reward these constructive acts of defiance.

With their ability to conceptualize new and better ways of conducting business, mavericks are valuable at the front end of a systems project. They also can be instrumental down the road in managing a prototype of a new system or organizational group. Mavericks chomp at the bit for a chance to demonstrate their ideas and are defiant in their efforts to prove them to the status quo.

> *Change agents produce conditions necessary for others to make changes happen. They set the stage and write the script. Someone else acts the part and gets the credit.*

The Undercover Agent: Many change agents face the seemingly insurmountable problems of having no mandate from above, no budget, no staff and no sponsor within the corporation. The effective agent in this situation is extremely resourceful at building Trojan horses. He or she will find some way of getting others into the middle of things, whether by funding a small prototype of an information system out of the IS budget, or by generating a new report that captures valuable business data about things that were hard to glean or abstract from the old system—for instance, customer profitability. This can start to feed changes in perspective.

The Travel Agent: These come in two versions: One, under the guise of creating "buy-in" to a new information system, sees how much frequent-flyer mileage he or she can rack up by interviewing everyone before, during and after every action step or milestone. The other understands that learning often comes through play. This version works to build the systems and structure that foster a learning environment and make change fun.

In one company where the prospect of change from a new information system was inducing deadly seriousness in people, management broke the tension by creating a "Joy Committee." Chartered with injecting fun back into daily business life, the committee planned parties, renamed routine tasks with ludicrous names, and staged off-beat awards.

Too much seriousness can kill the spirit of excitement that comes with innovation in the workplace. The Travel Agent understands that people under stress need to have a good time, and he or she knows how to channel fears and frustration into positive energy. Throughout the process of change, people need to be reminded that the flip side of a threat is an opportunity.

The Insurance Agent: Change can be terrifying for organizations. Sometimes people simply need the reassurance that things will be OK. Insurance agents avoid making vague or bold promises and instead are skillful at instilling a sense of calm in people's emotional state.

This agent acknowledges the risks involved in the changes and works to put safety-net programs in place to catch those who fall. For example, he or she may push a policy that workforce reduction will come through normal attrition, or that all displaced employees will receive adequate training for another position.

The Government Agent: Bold moves are necessary for change to occur, but even some of the boldest get trapped in the bureaucratic quagmire. Government Agents know their way around large bureaucracies.

They appreciate that the change process requires great patience. And they have a great sense of timing about when to blow the whistle and when to move things forward.

The Ninja Agent: Most businesses are motivated to change not by recognizing great new business opportunities but rather by having things go awry. The Ninja Agent is a disciple of Machiavelli who understands that the change process requires both a carrot and a stick. The "soft" approach of visioneering, recognizing early successes, communicating and educating must be supported by a "hard" line of removing assassins, naysayers and idea-killers. It also requires new management control systems that create accountability and incentives and include new budgets.

Spiritual Agents: These people believe Machiavelli was wrong. They exhibit and use the nine fruits of the spirit to manage change—love, joy, peace, faith, goodness, kindness, mildness, forbearance and self-control. Their objective is to inspire others, to remove barriers and to empower people so that what would be considered a miracle in the old environment can be achieved.

Spiritual agents know that preaching alone won't cut it. They first practice the changes they seek in others. And knowing that no amount of planning can address all the contingencies in managing the human side of technology-driven change, they make themselves accessible to all.

You may have played some of these roles in managing change in one of your major systems projects. In the future, as information systems make increasingly powerful and substantive changes in the way people and processes work, the chief information officer will not have a choice. He or she will have to play an instrumental role in managing the organizational implications of information technology. And this role has to begin long before the first specification is written.

Chuck Callan is vice president of the Index Group, a consulting firm in Cambridge, Mass., that specializes in helping companies re-engineer their business through the effective management of information technology.

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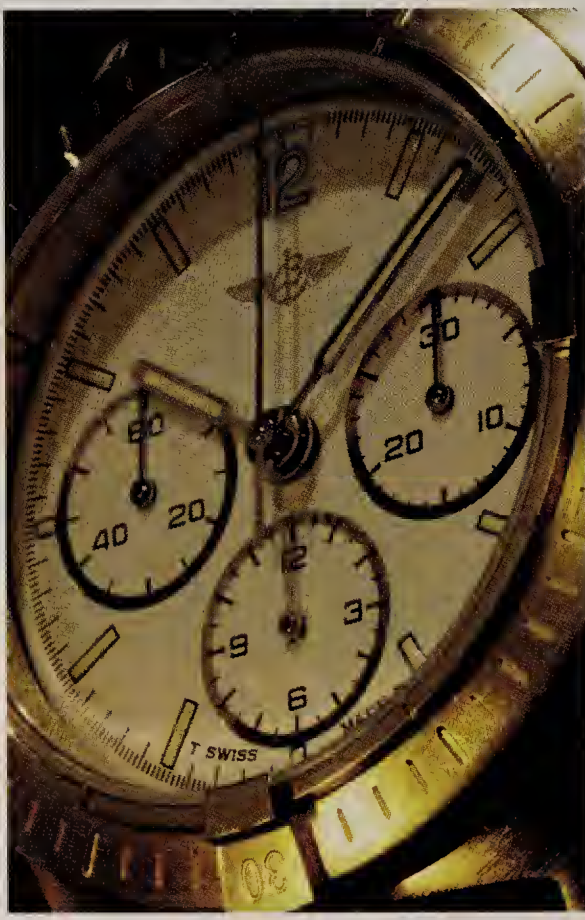

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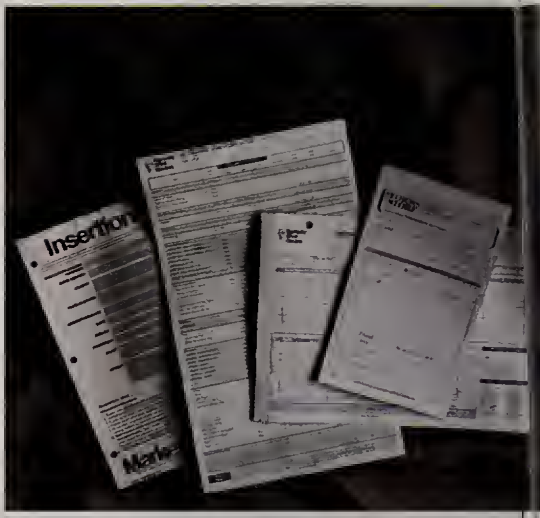

Standard Register, one of the nation's largest makers of business forms, has struck a deal with BLOC Development of Coral Gables, Fla., to become a licensee and reseller of BLOC's forms-automation system. Use of the system internally will enable Standard Register's designers to greatly simplify and shorten the process of creating new forms or revising existing forms for customers. In addition, BLOC's forms-generation software (called Pro Designer) will be available to customers who choose to create or modify business forms on their own and then transmit them electronically to Standard Register manufacturing facilities. By eliminating the laborious and time-consuming manual aspects of forms design, the company expects the system to make possible delivery of finished forms within a few days rather than weeks.

Standard Register can be reached at 513 443-1000.

Pest Control

MicroTouch Systems Inc., of Wilmington, Mass., has introduced the UnMouse, a stationary PC input device. The user moves the cursor by sliding a finger over a 3- by 4½-inch glass tablet.

The device also functions in mouse and track-ball modes. In addition, it has 12 programmed keys that emulate function keys. Templates for several programs, such as WordPerfect and Lotus 1-2-3, are included, as is software that enables users to program their own keystroke combinations.

The UnMouse, which has a Serial RS-232 interface and can be used with IBM XT, AT and PS/2 PCs and compatible machines, sells for $235. For info call 1-800-UNMOUSE.

OS/2 User Hot Line

Microsoft Corp., of Redmond, Wash., has formed a consulting group that will help large corporate customers use Microsoft products in designing and operating complex information systems that incorporate PCs. The company also announced that it will inaugurate a telephone hot line offering technical support for OS/2 end users who need help installing, configuring or running that PC operating system.

The consulting group—Information Technology Integration Services (ITIS)—is Microsoft's entry into what the company expects to be a $700 million market by 1993. In addition to its planning and design services, ITIS will help train executives, develop custom applications and provide ongoing technical support for the installations.

The hot line (900 896-9600) offers assistance from 8 a.m. to 5 p.m. Pacific time, Monday through Friday (except holidays), for $2 per minute. Although Microsoft's OEMs will continue to be the primary source of support for their customers, the 900-line is intended to complement those efforts.

Look It Up Online

The Houghton Mifflin Co. of Cambridge, Mass., has unveiled the American Heritage Electronic Dictionary (AHED), a reference and writing tool comprising a software version of its popular *American Heritage Dictionary* and powerful search features. AHED includes definitions for more than 116,000 words and subjects, including etymologies and usage. A SearchText feature helps users generate ideas, remember unusual words or verify facts. For instance, a user can find out what kind of money is used in India by keying in "currency and India."

Also included in the AHED are the complete Roget's II Electronic Thesaurus, a spellchecker, cut-and-paste capabilities, and a wild-card feature that will find a word using only a few letters or an approximate spelling. People who cheat at word games will like the anagram feature. AHED is compatible with most popular word-processing features and sells for $89.95.

Teleconference-to-Go

NEC America Inc. has developed a portable product that overcomes many of the drawbacks of current teleconferencing technologies. VoicePoint is a fully interactive, full-duplex audio-conferencing system that weighs only 3.3 pounds, fits in a briefcase and can be set up in seconds. It replaces conventional microphones and telephone speaker phones with filtered, simultaneous communication that is free of echoes, clipping and feedback. VoicePoint can pick up comments from up to 20 feet away.

The price is $1,299. For information, call NEC at 408 433-1279.

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Computer Security Conference

Atlanta Hilton, Atlanta
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Computer Security Institute
415 267-7651

Among the topics discussed are white collar crime, high-technology investigations, auditing the microcomputer environment, disaster recovery planning, creating security awareness in general management and developing computer security policies and procedures. Registration fees: $845-$990.

AUTOFACT '90

Cobo Center, Detroit
November 12-15
Society of Manufacturing Engineers and the Computer and Automated Systems Association
313 271-1500

This conference and exposition focuses on computer-integrated manufacturing and the automated factory. Highlighted presentations include surviving in the global market, the competitive advantage of total quality and information management for manufacturing. Registration fees: $110-$800.

Governing Disasters

Sheraton Charleston, Charleston, S.C.
November 13-16
Council of State Governments
606 231-1880

This conference is designed for federal, state and local decision-makers involved in emergency management. The agenda is organized around three tracks: information dissemination and management; administrative, federal, state and local coordination and legislative policy; and contingency management case studies. Registration fees: $225-$375.

PROCIEM '90

Hyatt Regency Westshore, Tampa, Fla.
November 14-16
The Florida High Technology and Industry Council
407 249-6102

This conference on productivity through computer integrated engineering and manufacturing focuses on surviving the '90s in a new world marketplace. Full-length papers, extended abstracts and panel sessions addressing CIEM issues are presented. Registration fees: $20-$225.

The Project Management Certification Program

November 15 & 16
December 13 & 14
Boston University Corporate Education Center, Tyngsboro, Mass.
Boston University Center for Project Management
508 694-9731

The Project Management Certification Program comprises a series of eight courses for technical project managers. "Managing the Project," held on November 15 and 16, covers fundamentals such as the planning process and estimating and measuring performance. The second course, offered December 13 and 14, is entitled "Managing the Environment" and covers project development and CASE tools. Other courses in the program, which concludes in June, include "Quality Assurance & Project Management," "Building High Performance Teams," "Becoming a Change Agent" and "Negotiation Skills." For further information on courses and fees, contact the program director.

OSI III: The Interoperability Advantage

Hyatt Regency, Crystal City, Va.
November 27-30
Phillips Publishing Inc. and the Corporation for Open Systems
301 424-3338

This conference addresses the tactical and strategic topics confronting companies that see OSI as a network solution. Topics include ISDN, procurement and evaluation of OSI products, network operating systems, X.400/X.500 migration issues, and security. Registration fees: $250-$945.

CAUSE '90

Fontainebleau Hilton, Miami Beach, Fla.
November 27-30
Association for the Management of IT in Higher Education
303 449-4430

This conference features more than 50 presentations on various aspects of managing IT on campus. Issues include planning and strategy, funding and accountability, managing academic information systems and managing applications and technology. Registration fees: $385 for members; $535 for nonmembers.

International Contingency Planning Conference & Expo

The Fairmont Hotel, Dallas
December 5-7
Contingency Journal
and the Professional Development Institute
817 267-5671

The conference has four tracks: novice, technical, executive and small business. Topics include contingency planning and the bottom line, telecommunications recovery methods, legal liabilities and writing and auditing a contingency plan. Registration fee: $695.

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A.	Total number of copies printed (net press run)	53,188	53,300
B.	Paid and/or requested circulation		
	1. Sales through dealers and carriers, street vendors and counter sales	0	0
	2. Mail subscriptions paid and/or requested)	44,804	46,651
C.	Total paid and/or requested circulation	44,804	46,651
D.	Free distribution by mail, carrier or other means, samples, complimentary and other free copies	4,900	4,910
E.	Total distribution (Sum of C and D)	49,704	51,561
F.	Copies not distributed		
	1. Office use, left over, unaccounted, spoiled after printing	3,484	1,739
	2. Returns from news agent	0	0
G.	Total (Sum of E, F1 and 2 -- should equal net press run shown in A)	53,188	53,300

I certify that the statements made by me above are correct and complete.

Leslie L. Falkner

Leslie L. Falkner
Vice President, Operations

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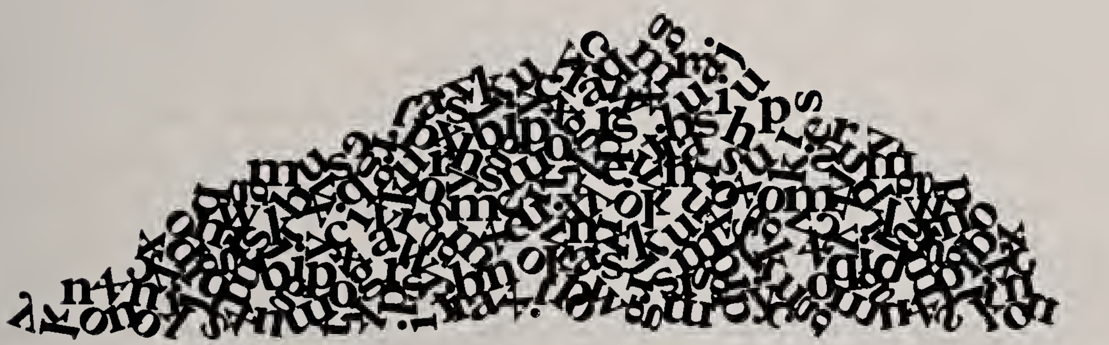
everything



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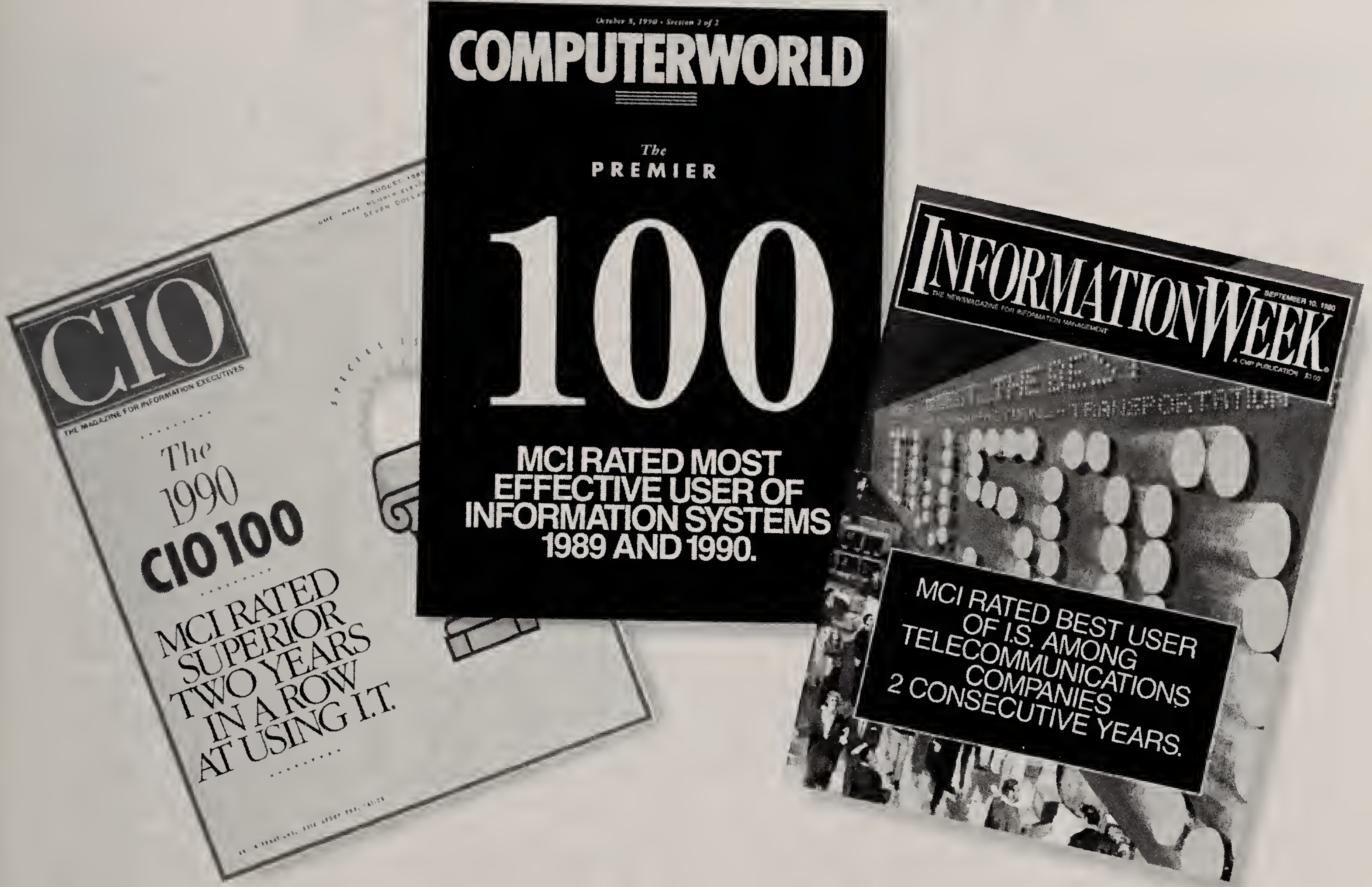
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CONFERENCE CALL

QUESTION: *What are the differences between today's graduates of IS programs and those of yesteryear?*

As the role of corporate IS has changed, so have undergraduate and graduate IS programs. Today's graduates have broader skill sets and more professional options.

Eric K. Clemons

Associate professor of Decision Sciences and Management at The Wharton School of Business at the University of Pennsylvania in Philadelphia

“ There's a difference that I find quite disturbing, and that is that there are fewer IS graduates today. Almost across the board, the enrollment in MIS courses in major business schools is declining. And I find that extremely disturbing because it's going to be almost impossible to function in a planning capacity in any organization without real familiarity with information systems. You won't be able to do intelligent marketing; you won't be able to do manufacturing; you won't be able to manage inventory without an IS background.

“The students who are coming out of MIS programs today probably are better-rounded, better all-around corporate players because they have a better understanding of the impact of systems. Not long ago you could take an MIS course at a business school and be forced to take Cobol programming or assembly-language programming, and that's nonsense. The people who are coming out of the programs now—at least they understand the implications of systems for their business.

“They're certainly better-qualified to set goals and to make sure the MIS function is responsive to the organization's strategic needs. The question of whether or not they can handle the technical challenges remains to be considered.

“We're currently redesigning the curriculum here at Wharton, and there's a pretty active discussion on whether MIS should be a separate program or whether it should be woven throughout the program so you can't graduate without it. ”

Dr. Donald A. Marchand

Dean of the School of Information Studies at Syracuse University in Syracuse, N.Y.

“ Ten years ago, I presumed kids that were graduating were heading into systems analysis, project management, DP—going toward the more technical routes. Today we're looking at IS organizations that have new kinds of structures—both the traditional organizations and the information centers for marketing and manufacturing. They might run telecommunications or do business analysis with the IS organization. There's a broader set of options.

“We have found in a recent assessment of 100 East Coast companies that most recent grads start at the programmer and analyst level to give them a flavor of the business for six months. They get a real sense of what the organization is all about by doing programming, systems analysis, systems design and project management.

“The other career track is to go directly to work with the business unit where they are working, such as marketing, accounting or finance. This is more common among small to medium-size companies because they need an intermediary between the business units and IS.

“At Syracuse, professional expectations are pretty evenly distributed. Some want to go into an IS business unit because they feel they can get closer to the business/management side. Others want to be consultants for user companies. There's a big pursuit for these students—IT consulting is a big area. Some will go to work directly for the IT industry, for a vendor in product development or sales. Several recent grads have gone to work for small entrepreneurial organizations. The pay is less, but they feel they'll learn the most. ”

Howard Miller

Assistant vice president for University Information Systems at Boston University

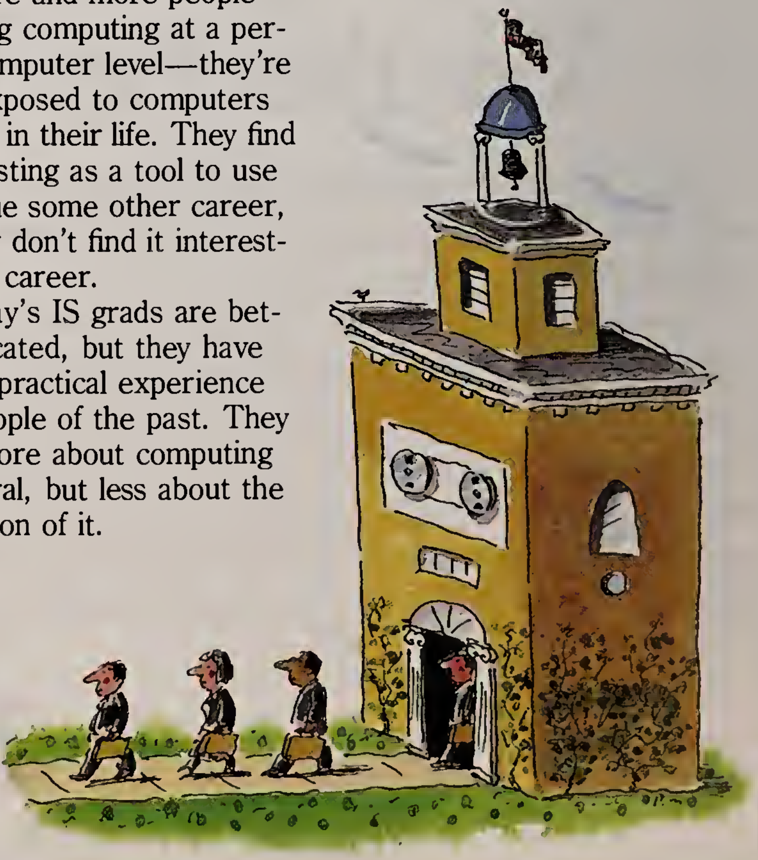
“ The biggest difference between IS students today and those of a decade or so ago is that there are so few of them coming into the profession. It's very difficult for us to attract new people into the profession, especially from the college ranks. Fewer and fewer people seem to be taking the IS programs the university offers. One reason might be that more and more people are using computing at a personal computer level—they're being exposed to computers early on in their life. They find it interesting as a tool to use to pursue some other career, but they don't find it interesting as a career.

“Today's IS grads are better-educated, but they have far less practical experience than people of the past. They know more about computing in general, but less about the application of it.

“I don't think that their expectations differ from the past. I think the difference is that the people who enter the profession from the technical school ranks, or from some other avenue, have lower expectations than those who enter it from a college curriculum. Those who enter from a college curriculum seem to expect to move into a management rank a lot faster.

“Boston University offers data processing programs out of a number of schools—engineering, the college of liberal arts, the metropolitan program, and the school of management. The programs out of engineering and liberal arts tend to have more computer-science types of curriculums. The ones out of the Metropolitan College tend to be more practically oriented, more application oriented. The students at the School of Management obviously get more opportunity to gain more business skills than students in the other schools. ”

Readers are invited to suggest Conference Call questions. Contact Senior Writer Meghan O'Leary at 508 935-4733 or by fax at 508 872-0618.



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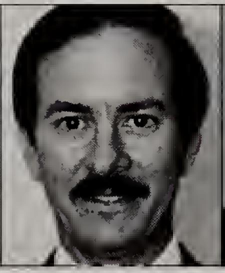

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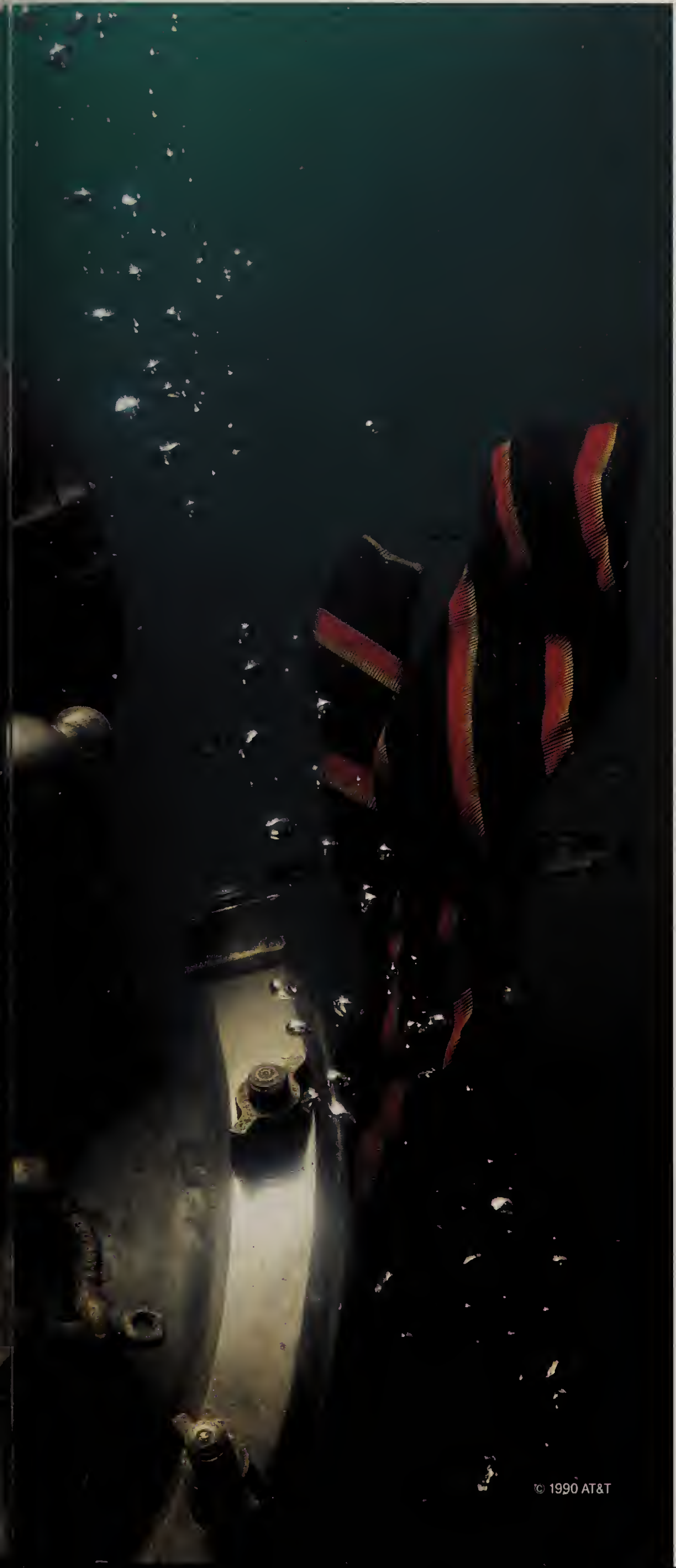

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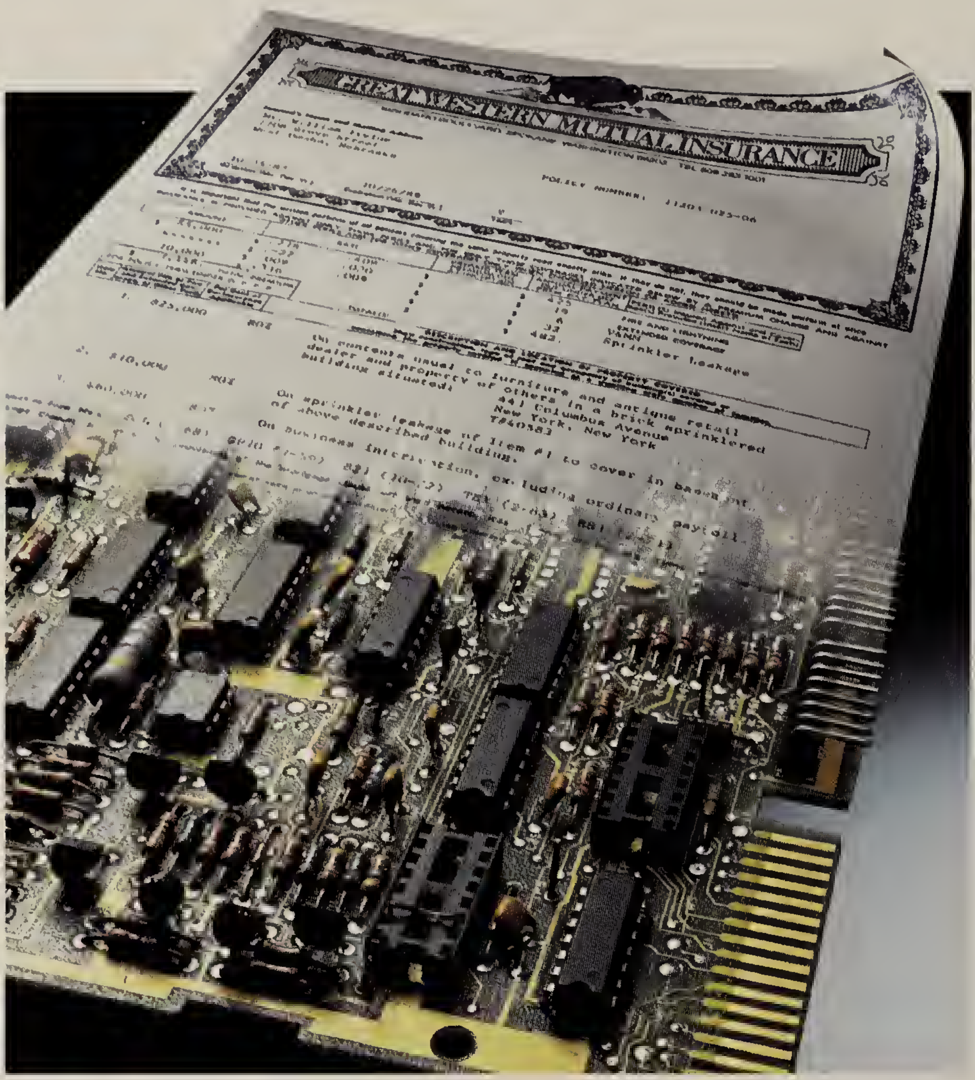

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